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The Allocation of Time to Non-Market Off-Farm Activities by Farm Household Members in the West of Ireland

A thesis submitted in fulfilment of

the degree of Doctor of Philosophy

by

Sinéad Keogh B.A. M.A.

The Discipline of Economics

J.E. Cairnes School of Business and Economics

National University of Ireland, Galway

February 2014

Declaration

I declare that this thesis, submitted to the National University of Ireland, Galway for the degree of Doctor of Philosophy (Ph.D.) has not been previously submitted as an exercise for a degree at this or any other University. All research herein is entirely my own.

Signature: Date:

Abstract

Community development and social support systems have evolved uniquely in rural Ireland. In response to poverty and other historical developments, dense networks of families, friends and neighbours often formed strong informal social support systems, allocating time to help each other. Such behaviour is consistent with the 'meitheal' tradition, the idea of spirit of community or connectedness within groups of neighbours, an ethos that is preserved and safeguarded among farming communities throughout the West of Ireland. Over the past two decades, evolving farm and trade policies, new technologies and a challenging economic climate have started to impact on the behaviour and time management decisions of farm household members in Ireland. Thus, an analysis of the economics of time allocation is important for understanding how farm family members adjust to these changes and the implications of these changes on their unique support systems and well-being. Within this context, this thesis considers the allocation of time to non-market off-farm activities by farm household members in the West of Ireland. Time allocated to activities such as civic engagement and volunteering plays an important role in the delivery of socially important goods and services that seek to improve the well-being of the rural population and promote rural sustainability. In turn, the social capital generated from such off-farm non-market activities and the use of leisure time by farm household members is an important dimension of social well-being, enhancing the health status of the individual. Therefore, the overarching goal of this thesis is to provide a detailed understanding of how time allocated to non-market off-farm activities impacts on individual well-being, rural development and sustainability. To this end, a single-purpose time use diary survey combined with individual and household questionnaires that collected information on respondents' background characteristics was developed, administered and analysed and three specific research objectives addressed. First, a profile of time and task management of farm family members in the West of Ireland is presented. Second, the factors that influence the participation in and the number of hours dedicated to civic engagement, formal and informal volunteering are explored. Third, the factors that influence the level of participation in active, passive and social entertainment leisure activities are investigated. Finally, this thesis makes a substantiative methodological contribution by way of the innovative design of the time use diary which has the potential to change the way that these types of surveys are conducted.

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List of Abbreviations and Acronyms

ATUS	American Time Use Survey
AEOS	Agri-Environment Options Scheme
CAP	Common Agricultural Policy
CTUR	Centre for Time Use Research
EEC	European Economic Community
EFTA	European Free Trade Association
ESM	Experience Sampling Method
EU	European Union
EUROSTAT	Statistical Office of the European Commission
FAO	Food and Agriculture Organisation
FFI	Family Farm Income
FSS	Farm Structural Survey
HETUS	Harmonised European Time Use Survey
IATUR	International Association for Time Use Research
ICMSA	Irish Creamery Milk Suppliers Association
ICSA	Irish Cattle and Sheep Farmers Association
IFA	Irish Farmers Association
ILO	International Labour Organisation
INSEE	National Institute of Statistics and Economic Studies
INSTRAW	The International Research and Training Institute for the Advancement of Women
ISSDA	Irish Social Sciences Data Archive
MTUS	Multinational Time Use Survey
NCI	National College of Ireland
NESF	The National Economic and Social Forum
NFS	National Farm Survey

OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
PDA	Personal Digital Assistant
REPS	Rural Environmental Protection Scheme
SFP	Single Farm Payment
SMD	Standard Man Day
UAA	Utilised Agricultural Area
UN	United Nations
UNSD	United Nations Statistics Division

“Time is a precious, fundamental resource, as essential in our lives as air and water. Although renewed every day, it is finite. How well or wastefully it is used determines the progress, achievement, and well-being of individuals, families, communities and societies throughout the world.”

Ironmonger (2007)

1. Introduction

1.1 Background

The term 'family farm' refers to individual farm holdings, owned by a family, where production is achieved almost exclusively through family labour. Permanently employed labour is relatively uncommon on family farms, except on large holdings, though the majority of small holdings do temporarily employ the services of agricultural contractors to provide specialised equipment and services such as silage harvesting or manure spreading. This relieves farmers of the burdens associated with direct employment and seasonal tasks of short duration. Historically, agriculture in Ireland has been a family-orientated activity with farms, consisting of relatively small units, being largely family owned and operated. Even with the recent consistent decline in the number of farms and subsequent increase in average farm size, the agricultural sector remains a vital element in the national economy, while virtually all farms remain family enterprises. This is the case not just in Ireland but in the majority of member states of the European Union (EU) (Eurostat, 2011).

The family farm has a major ideological importance in Irish culture (O'Hara, 1998). The significance of, and the ideological commitment to, the family farm can be traced back to the 17th century during which time British cartographers produced maps of Ireland. The cartographers, working for Ordinance Survey, identified areas and regions in Ireland by virtue of the families that resided in them and not by the usual method of the identification of towns and villages. Consequently, farms in Ireland are usually named after the family that farm them and the townland the farm is located in. Examples include the O'Gradys of Killeaton, the Mulcahys of Ballysheehan and the Smyths of Behaglas (Irish Research Council, 2013). The identification of regions by the family that reside in them captures a central aspect of Irish culture, the relationship between kin groups or families and the areas in which they farm and live. The decline in the number of farms and the real or imagined threat of extinction have reinforced the ideological commitment to family farming as the best way of ensuring the future viability of rural communities (O'Hara, 1998). In debates on the future of agriculture in the context of changing market conditions, such as the reform of the Common

Agricultural Policy (CAP), the importance of the family farm is frequently stressed and the alternative portrayed as factory farming.

The main aims of rural development policies, in Ireland and the EU, include the safeguarding of family farms and the enhancement of the quality of life of people living in rural areas. Article 45.2.v of the Irish Constitution affirms that the State is obliged to ensure that as many families as possible are retained on the land (Bunreacht na hÉireann, 1937). Maintaining the maximum number of rural households, and especially family farms, is an objective endorsed in the 1999 White Paper on rural development (Department of Agriculture *et al.*, 1999). In its 'Model of European Agriculture', the EU outlines its desire to develop a farming sector that serves rural communities and whose role is not just to produce food, but to guarantee the survival of the countryside as an attractive place to live and work. It identifies that family farming is a social form delivering a variety of economic and other services to society, including: the safeguarding of viable rural societies and infrastructures; balanced regional development and rural employment; maintenance of traditional rural landscapes and bio-diversity; and the protection of the environment (European Union, 1999).

Thus, it is widely recognised that agriculture is not only a sector of economic value but that it, and the farm families that it supports, play a much wider role in society as a whole. Consequently, policy objectives are directed at farm households and their members (Smyth *et al.*, 2011). Research examining the typical patterns of time use and the behavioural decisions of farm household members is useful to inform such policy frameworks. Development policies, and in particular rural development policies, be they poverty alleviation, safety nets, infrastructural projects, agricultural sustainability projects or rural social inclusion programmes, can benefit from the information that comes from the study of the allocation of time of farm household members.

The West of Ireland is a distinctive area in which to examine the allocation of time of farm household members. This is because its history has been marked by self-sufficiency and subsistence activities such as farming and fishing (Matthews, 1986; O' Cinnéide and Walsh, 1990; Devereux, 1993). In response to poverty, land conflict and other historical conditions in the West of Ireland, tight groupings of families, friends and neighbours formed strong informal social support systems generating a longstanding tradition of voluntary activity and

charitable service (Volunteering Ireland, 2010). Such behaviour is consistent with the traditions of '*meitheal*' and '*cooring*'. Meitheal is an Irish word that describes the tradition of farm household members coming together to exchange labour in agricultural work and provide assistance to one another to harvest crops and support one another in business. The word *coor* from the Irish verb '*comhair*' means to cooperate (Brennan and Luloff, 2007). It encompasses the idea of spirit of community or connectedness within groups of neighbours in rural areas. These traditions were important cornerstones of peasant Ireland as a sense of social solidarity or belonging, as well as self sufficiency and reliance, were generated when a community 'helped' its own in order to get farm work done. Arensberg and Kimballs' (1940) anthropological classic, *Family and Community in Ireland* describes this system of mutual support within the farming community. It is these traditions and a culture of self-sufficiency that sets Ireland apart from other countries and still serves as a link between the farming and the rural community to foster social capital (Bogue, 2005).

Heritage, culture and language are identifying factors in many areas along the west coast of Ireland with farm families forming an integral part of the rural landscape and rural society. The consensus of empirical studies is that family farming in the West of Ireland is distinctly different to more commercialised farming areas in the East and South of the country (Scully, 1971; Brody, 1973; Kelleher and O'Hara, 1978; Hannan, 1979; Scheper-Hughes, 1979; Curtin, 1986; Curtin and Varley, 1987; Hannan and Commins, 1992). Its location on the periphery, not just of Ireland but of Europe, away from the influence of larger towns and cities has meant that many areas have escaped from intense development pressure. Recent debates on the contextual importance of social capital suggest that rural settings are at an advantage as their social networks are well preserved and integrated (Frohlich *et al.*, 2001). Thus, the spirit of the Irish traditions of meitheal and cooring has been safeguarded and is still evident in rural Ireland, having spread from farming communities to encompass all rural dwellers, particularly in the West where the traditions originated (Bogue, 2005; Creamer *et al.*, 2009). Despite the apparent incapacity of the majority of farm holdings to generate an adequate income (comparable to those obtained outside farming), family farming persists. A sense of goodwill and neighbourliness prevails and vibrant communities thrive. By maintaining community and voluntary ethos and networks, farm families contribute significantly to the quality of rural life as it is generally accepted that unpaid work in the community is productive (O'Hara, 1998; Fleming and Spellerberg, 1999). These networks are

an important factor in forging new and strengthening existing links between new and more traditional rural communities.

The farming and rural non-farming community are linked in a number of ways, ranging from the interaction of members of farm households with businesses in their local area through the purchase of goods and services, to the rise in pluriactivity, linking the behaviour of farm household members with the off-farm labour market, the community and the State. In economic theory, farmers are assumed to be profit maximisers, though farming is a way of life and farm family members have other non-economic goals involving their leisure time activities, pleasurable work and family living, as well as civic and voluntary work in the community (Gasson, 1973; Coughenour and Swanson, 1983; Day, 1983; Patrick *et al.*, 1983). Time is the resource that farm family members use to achieve such non-economic goals. While the physical activity of farming is important and considered a desirable and pleasurable activity, the other activities in which farm household members participate are also of considerable importance to their quality of life. Many owners of small, non-profit generating farms continue to farm, rather than rent their land to larger and more efficient farm operators because they value the lifestyle that the family farm affords them (Coughenour, 1977; Campbell, 1981; Heffernan *et al.*, 1982; Garkovich *et al.*, 1995). Thus, running a farm is not only a business, it is a way of life that provides benefits to all members of the household in a rural environment. An advocate of farming as a way of life, Marty Strange, contends:

> Above all, family farming carries with it a commitment to certain values, entirely independent of the pettiness of economics … Family farming may be a business, but it is not just a business. It is a way of life as well.
>
> (Strange, 1988, p35)

The nature of the links between the farm household and the local community are critical to the constant changes taking place in rural areas in Ireland. More than any other industry, the benefits of agriculture, both economic and social, are widely dispersed in the rural economy. Agriculture, or specifically farm households, support other activities and sectors in shaping the rural community and, in return, draw support from those activities and sectors. Most farms, even small family run farms, are small businesses. They are an important local employer in many rural regions and major players in the rural world. Irish farmers spend almost €8bn per annum on agricultural inputs and living expenses. This is comprised of

almost €3.9bn spent on inputs used directly and indirectly in the agricultural production process[1] and €4bn of farm household expenditure[2]. In a small-scale consultation with 27 farmers from eight counties, Phelan and O'Connell (2011) found that the vast bulk of input purchases and farm household expenditure by all farm households were made locally i.e. within a 35 kilometre radius of their farm. Given the geographical spread of farming, this level of expenditure contributes to the maintenance and social life of almost every town and townland in Ireland. It is therefore reasonable to assume that local economies throughout the country could be significantly impacted by changes in this behaviour.

Within this context, this thesis analyses the typical patterns of time use of farm household members in the West of Ireland, focusing specifically on participation and level of participation in off-farm non-market activities, as well as the factors that affect the well-being of farm household members. The data which forms the basis of this thesis is from the *Time Use of Farm Household Members in the West of Ireland 2011/2012 Survey*, a single-purpose time use diary survey, combined with individual and household questionnaires collected over a seventeen month period from April 1st 2011 to August 31st 2012. The survey was conceived, designed, executed and analysed by the author during the period in which this doctoral research was conducted. It was designed for the purpose of collecting time use data for a specific population group, farm household members, and thus, includes activities that relate directly to farm household members e.g. farm related activities.

Evolving farm and trade policies, new technologies and a challenging economic climate profoundly shape the behaviour and consequently the time use decisions of farm household members in Ireland. Thus, an analysis of the economics of time allocation has important implications for understanding how farm family members adjust to these changes, the implications of these changes on their unique support systems, well-being and links with their local communities. Furthermore, time allocated to off-farm non-market activities such as civic engagement and volunteering play an important role in the delivery of socially important goods and services that seek to improve the well-being of the rural population and promote rural sustainability. In turn, the social capital generated from such off-farm non-

[1] The National Farm Survey 2010.
[2] CSO Household Budget Survey (2009/2010).

market activities and the use of leisure time by farm household members is an important dimension of social well-being, enhancing the health status of the individual. Thus, a major goal of this research is to investigate how the time allocated to off-farm non-market activities impacts on both individual well-being and rural development and sustainability.

To facilitate a greater understanding of the focus and rationale behind this thesis, the rest of this chapter sets the context for the research, providing an overview of the agricultural sector in Ireland and outlining the economic challenges faced by farm households and how these shape the behaviour and decision making of household members. It begins in Section 1.2 with an overview of the agricultural sector in Ireland by way of a statistical profile. Painting a picture of the significant transformation that the agricultural sector in Ireland has undergone in the last number of years, it maps the changes that are ongoing with respect to farm numbers, size and type of enterprise, labour input, demography, income and the viability of family farms. This transformation can be largely attributed to Ireland's accession into the then European Economic Community (EEC)[3] in 1973 and the package of agricultural policies brought with it, specifically the CAP. In line with this, an overview of the CAP and thus the policy context in which farm households have operated in the past 50 years is also presented. In Section 1.3 the specific research objectives of this thesis are then identified and a discussion of the motivation or justification for this research is presented. Finally, the structure of the thesis is outlined in Section 1.4.

1.2 The Agricultural Sector in Ireland

Since this thesis is concerned with the time allocation of farm household members, it begins with an overview of the agricultural sector in Ireland. Agriculture is a key industry in Ireland with over 64% of the land area used for agriculture (Mechan *et al.*, 2010). It is the largest single production or service sector in Ireland, making a valuable contribution to the economic development of the Irish economy, as well as the viability of rural areas in Ireland. It is characterised by small owner-occupied farms with high inputs from multiple family members. In recent years, Ireland has experienced considerable social transition, with an economy that

[3] Subsumed into the EU in 1993.

boomed during the late 1990s and early 2000s and contracted after 2008. While the agricultural sector saw its role in the Irish economy reduced during the Celtic Tiger boom, it is now beginning to find a new role as a sustainable large-scale indigenous industry underpinning the recovery of the economy. It provides food and employment and has strong linkages with the agri-food[4] and other sectors. The primary agriculture sector[5] accounted for 2.7% of Ireland's gross value added[6] (GVA) at factor cost in 2011, 7.5% of all exports and 5.4% of national employment at the end of quarter four in 2012, while the agri-food sector accounted for 7.7% of GVA in 2011, 10.8% of all exports and 8% of national employment at the end of quarter four in 2012 (CSO, 2013; Department of Agriculture, Food & the Marine, 2013). Employment in the agri-food and primary agricultural sectors has the important attribute of being dispersed throughout all counties and so plays a critical role in balanced regional development.

Farming also plays an important role in maintaining the quality of the environment in Ireland. The landscape and the rural environment are inextricably linked with farming activity as farmers act as guardians of the countryside. Consequently, within the context of rural development policies in the EU, increasing emphasis is being placed on the role that farmers can play in rural development, including forestry, biodiversity and, most importantly, the diversification of the rural economy to create alternative jobs in rural areas (Eurostat, 2011). Within this overall context, the following sub-sections present a summary profile of Irish agriculture, its approximately 139,860 farmers and the CAP, the policy context within which Irish agriculture operates.

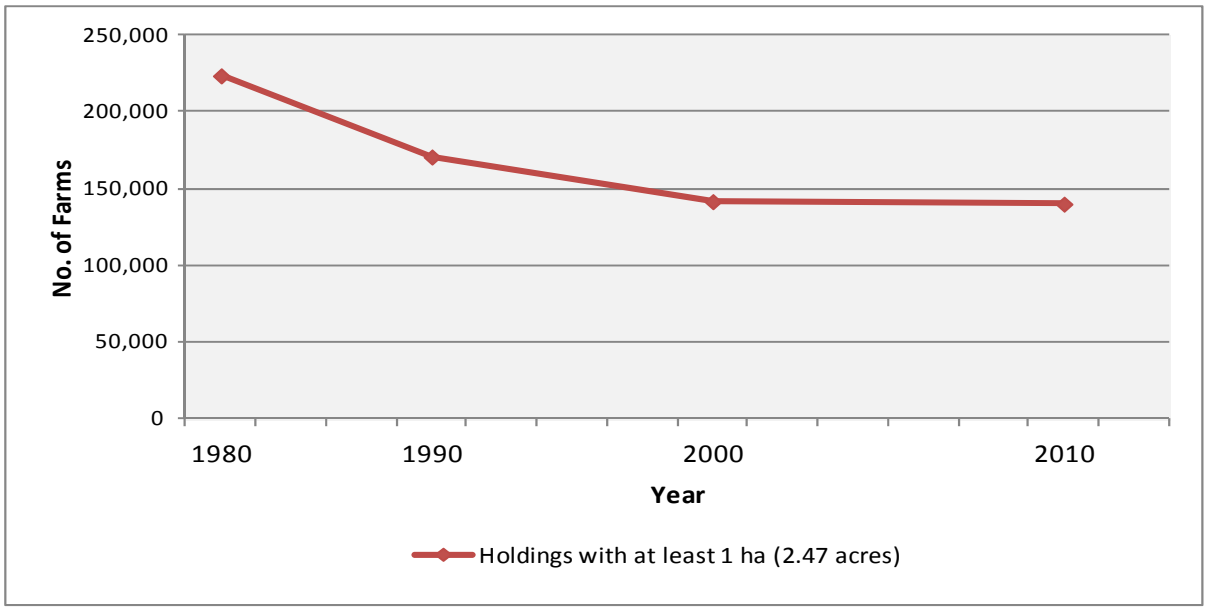
1.2.1 Farm Structure

This section looks at farm structures in Ireland using data from the Census of Agriculture 2010 (CSO, 2012a) and the Teagasc[7] National Farm Survey (NFS) 2012 (Teagasc, 2013), amongst other sources. The number of farms in Ireland has declined substantially since the

[4] Taken to comprise primary produce along with food, drinks and wood processing sectors.
[5] Taken to comprise agriculture, fisheries and forestry.
[6] Gross value added equals the value of output less the value of intermediate consumption.
[7] Teagasc is the agriculture and food development authority in Ireland.

1850s with a 37% decrease in farm holdings over 1 acre of UAA[8] between 1855 and 1980. The results of the CSO's Census of Agriculture 2010 show that there were 139,860 farms in Ireland in 2010 compared to 141,527 farms in 2000, 170,600 in 1991 and 223,500 in 1980 (Figure 1-1). This has resulted in an overall decrease of 37% between 1980 and 2000 and a decline of only 1.2% in the number of farm households between 2000 and 2010. Thus, the rate of decline has been greater in the 1980s and 1990s than in the last decade, though the data collection methodology used for the Census of Agriculture has changed with each census and the results may not be directly comparable. The decrease in farm numbers is a general trend observed across member states of the EU.

Figure 1-1 Number of Farm Holdings 1980 - 2010



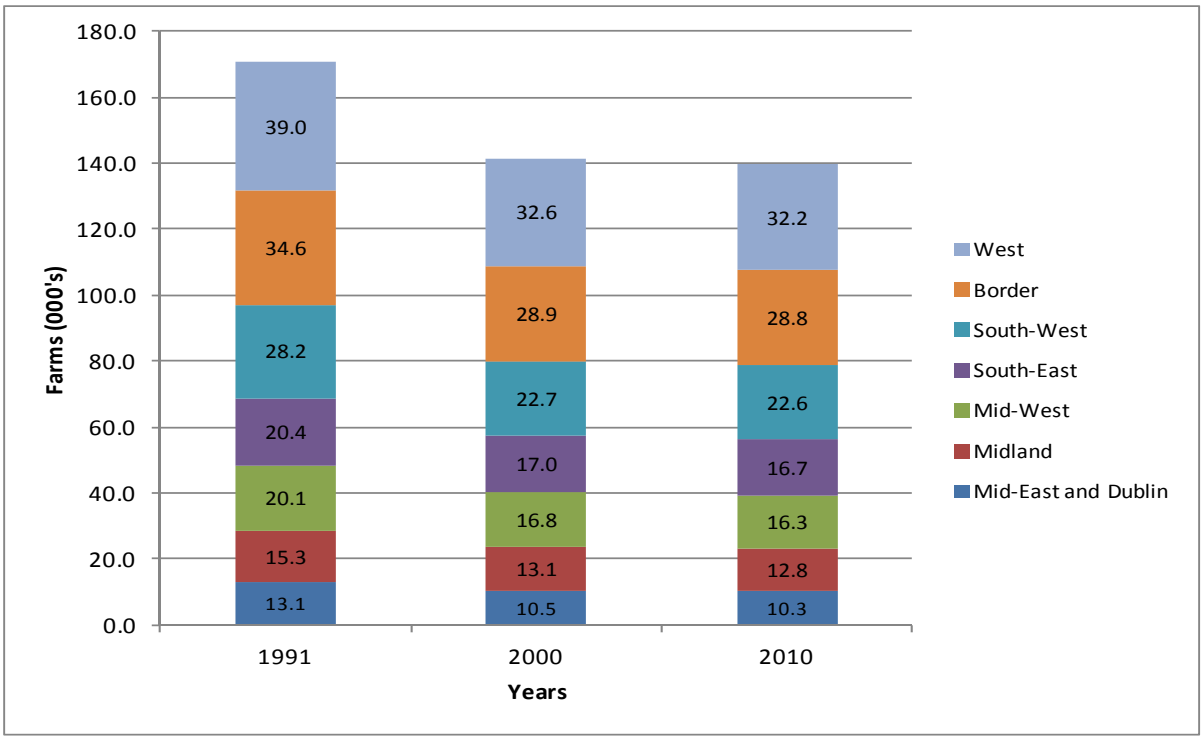
Data Source: European Community (2000); CSO (2007, 2008, 2012)

While the decline in the total number of farm holdings is spread across most regions of the State, it is most pronounced in the West of Ireland, specifically counties Galway, Mayo and Roscommon. Figure 1-2 provides a graphical illustration of the number of farms in the State from 1991 to 2010 classified by region. The Western region has experienced a decrease of approximately 6,800 farm holdings in the period from 1991 to 2010, the largest decrease across the seven regions. The Border has seen a decline of 5,800 farms in the same period

[8] Utilised Agricultural Area (UAA) is the combined area under crops, silage, hay, pasture and rough grazing land in use.

while the South-West has experienced the third largest decline, 3,800 farms, in the same twenty year period. Furthermore, the Western region has also experienced the largest increase in the average age of farm operators. This is discussed in more detail in the section that follows. This information suggests that farming as a way of life is more unstable and susceptible to change in the West of Ireland than it is in any other region.

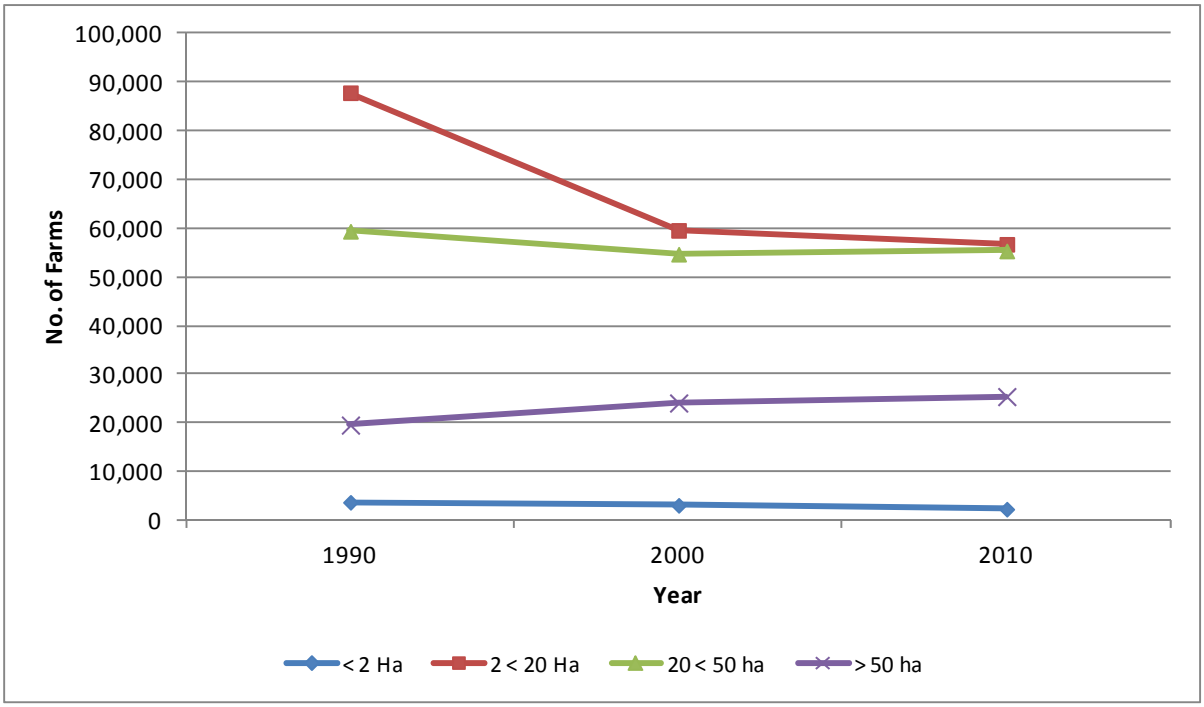
Figure 1-2 Number of Farm Holdings by Region 1991 - 2010



Data Source: European Community (2000); CSO (2007, 2008, 2012)

The overall decline in farm numbers also conceals significant differences across farm size categories (Figure 1-3). Over the period from 1990 to 2010, there has been a continuous decline in the number of farms of less than 50 hectares and significant growth in farms of greater than 50 hectares. Farms of less than 2 hectares have decreased by 38% in the years between 1990 and 2010, while there has been a 30% increase in the number of farms over 50 hectares in size. Predictably, average farm size has increased by 24% over the same period, from 26 hectares in 1990 to 32.7 hectares in 2010, slightly higher than the EU-27 average of 32 hectares (European Community, 2000; CSO, 2007; 2008; European Commission, 2011; 2012a). Major changes in farming practices and the allocation of time of farm household members are likely consequences of the restructuring of the agricultural sector and resulting consolidation, specialisation and intensification of farming in Ireland.

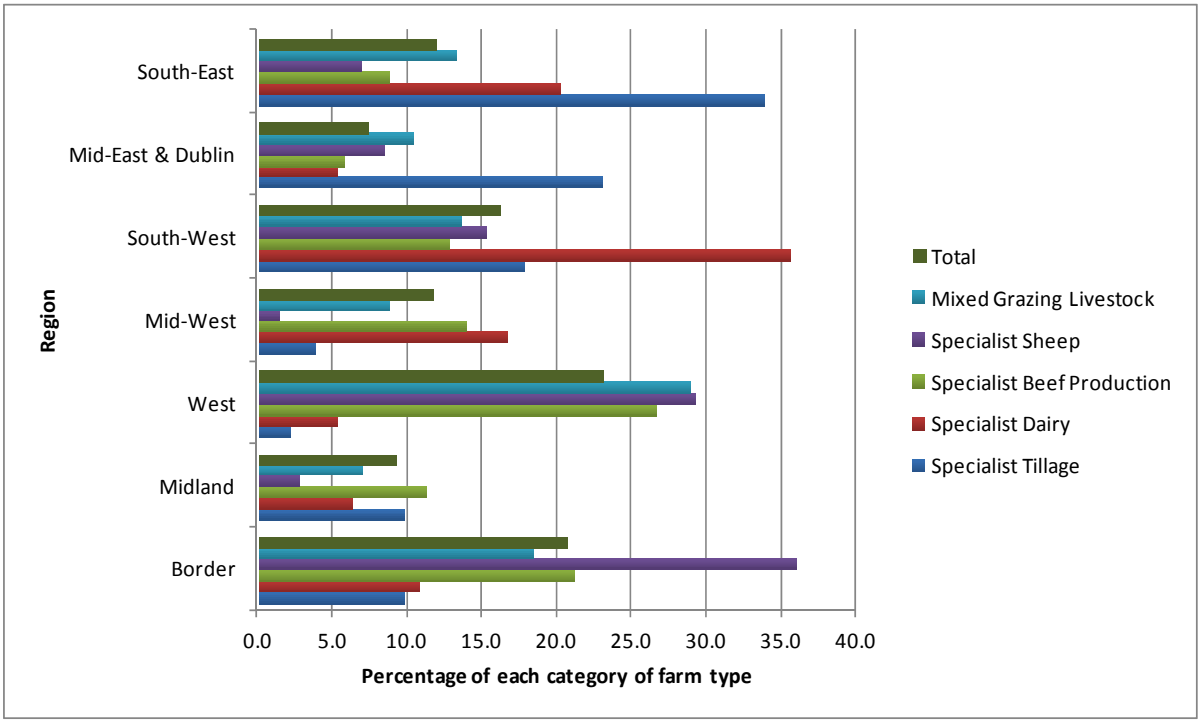
Figure 1-3 Number of Farm Holdings by Farm Size 1990 - 2010



Data Source: European Community (2000); CSO (2007, 2008, 2012)

In terms of farm system, specialist beef production is the principal farming system in Ireland with over 55% of farms classified as such. In excess of 11% of farms are classified as specialist dairying and a further 11% are classified as mixed grazing livestock. Specialist sheep farming accounts for almost 10% of farms. Collectively, beef and specialist sheep production account for 65% of all farming systems (CSO, 2012a). Intensive lucrative production has become concentrated on a minority of commercially-orientated, efficient and relatively prosperous larger farms. These farms, usually dairying or tillage systems, are mainly located in the East and South of the country, where the land is of better quality. Meanwhile, low density livestock farming is more typical on the small holdings in the West, the region of interest for this study, with 26.6% of specialist beef production, 29.3% of specialist sheep farming and 28.8% of mixed grazing livestock located in the region (Figure 1-4).

Figure 1-4 Distribution of Farm Types by Region, 2010



Data Source: CSO (2012a)

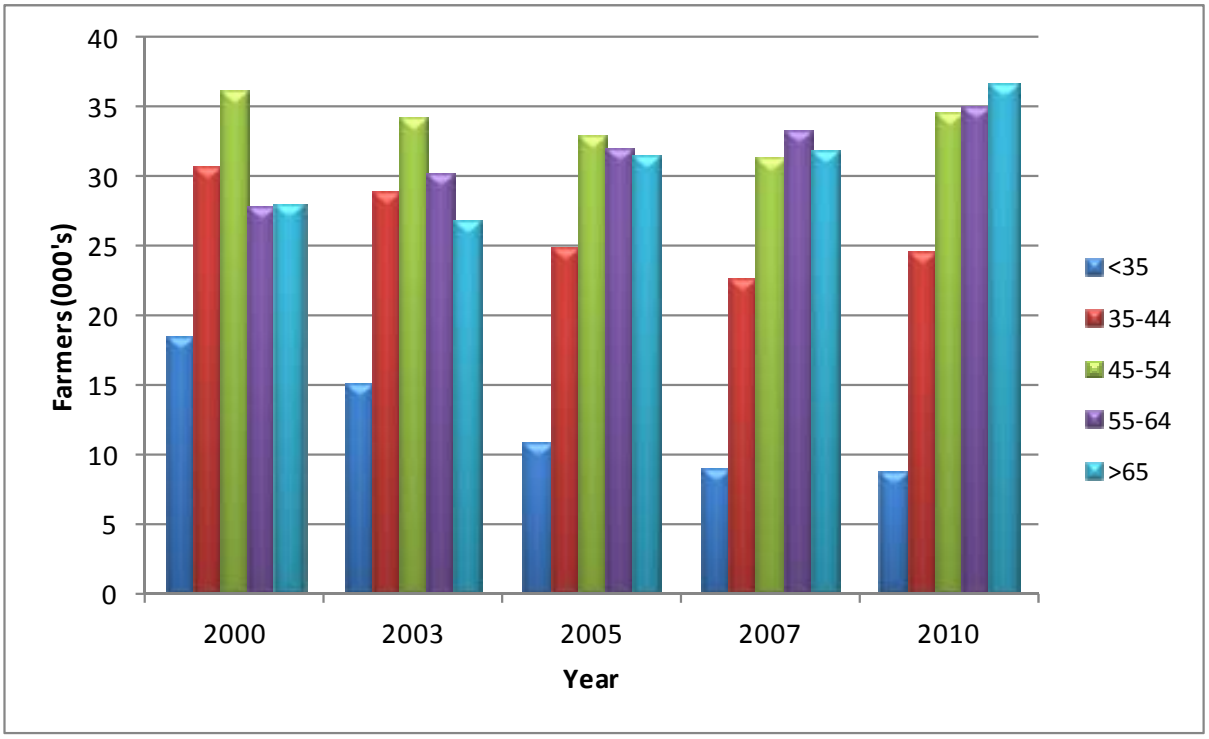
An important distinction in Irish farms is between full-time and part-time farms. A full-time farm is defined by Teagasc in the NFS as one that requires 0.75 standard labour units to operate calculated on the basis of standard man day (SMD) requirements, whilst part-time farms require less than 0.75 labour units. The number of SMDs required by an enterprise varies according to the standard of farm facilities. Farms are therefore divided into full-time and part-time on the basis of the estimated labour required to operate their business as distinct from labour available, which is often in excess of that required. In 2011, 31% of farms in the population were classified as full-time farms (Teagasc, 2012).

1.2.2 Age Profile of Farm Holders

Regarding the age profile of farm holders, the data shows that farm operators are getting older on average. Figure 1-5 presents the age profile of holders of family farms from 2000 to 2010 and illustrates that more than half (51.4%) of all farm holders in 2010 were 55 years or older, compared to just 39.5% of farm holders in 2000. This has been coupled with a decline in the number of farmers in the younger age categories over the period. The number of farm

operators aged less than 35 years of age more than halved in the ten year period from 2000 to 2010 from 18,382 to 8,683, representing just 6.2% of all holders in 2010. In 2010 the average age of farm operators was 55, an increase of 4 years from 51 in 2000 (and 52 in 1991). In the West there is a greater ratio of farm operators aged 65 years and over to holders aged less than 35 years (more than 7 to 1) than in any other region (CSO, 2008). The aging demographic within the farm population will most likely have a direct impact on the allocation of time of farm household members, particularly in the West of Ireland where the trend of aging farm holders is most pronounced.

Figure 1-5 Age Profile of Farm Heads, 2000 - 2010



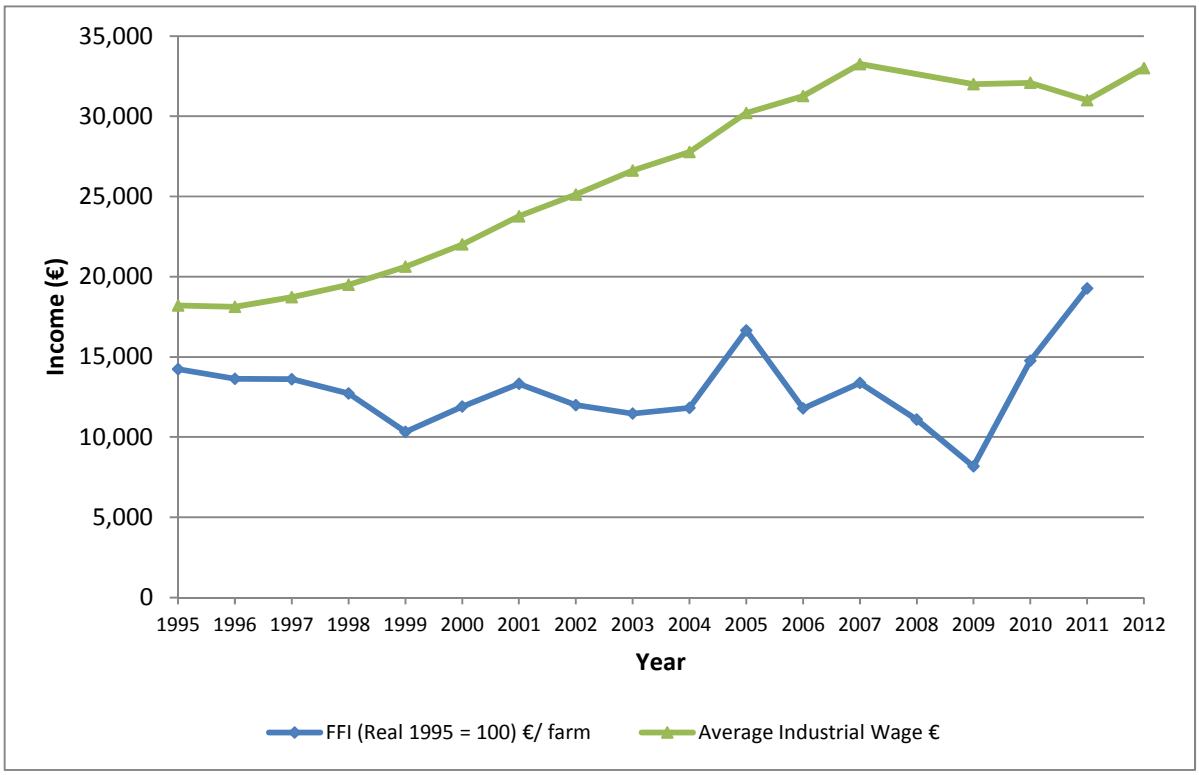
Data Source: CSO (2000); (CSO, 2007; 2012a) Eurostat (2009)

1.2.3 Farm Incomes

Average Family Farm Income (FFI)[9] is the principal measure of the income which arises from the year's farming activities and is calculated by Teagasc on an annual basis from data collected in their NFS (Teagasc, 2011). The trend in FFI compared to the average industrial earnings in the rest of the economy for the period 1995 to 2012 is illustrated in Figure 1-6. FFIs are largely made up of subsidies or payments from the EU or the Government of Ireland. National and EU payments include the Single Farm Payment (SFP), the Rural Environmental Protection Scheme (REPS), the Agri-Environment Options Scheme (AEOS), Disadvantaged Areas, Suckler Cow Welfare and Sheep Grassland Schemes. In 2012 subsidies comprised an average of 81% of FFI, a reduction from 83% in 2011, highlighting the reliance of farms on indirect payments for their survival (Teagasc, 2012; 2013). Further emphasising the reliance of farms on indirect payments, Phelan and O'Connell (2011) argue that a 20% reduction in direct payments would lead to a fall in farm incomes ranging from 9% to 39%, dependent on farm enterprise. It is important to note that FFI does not include income from non-farming sources (e.g. off-farm employment) and thus may not necessarily be equated to household income.

[9] FFI = Gross output (including land/quota let and direct payments) – (direct costs + overhead costs).

Figure 1-6 Family Farm Income 1995 – 2012



Data Source: Teagasc (2000 – 2012), CSO (2011)

It is notable that average FFI increased steadily from 2009 until 2011, mainly due to favourable market conditions for dairy and beef products, though average FFI fell by 15% to €25,483 in 2012. Figure 1-6 shows the relatively low levels and high volatility of farm family incomes in Ireland compared to the relative stability of the average industrial wage. This volatility can be attributed to trends in output, prices and, increasingly, in direct payments, as these are a function of farm income. For the period 1995 to 2012, industrial earnings exceeded FFI with farm incomes being typically 50-60% of industrial earnings. In 2009 average FFI was 37% of the industrial wage, but increased to 77% 2012.

While average FFI serves as a good base for understanding the financial situation of farm families, it masks the contrast between the incomes of families on different farm systems. In every year of the NFS up to 2012, the average FFI on the dairy and tillage systems was far higher than those on the drystock based systems. Average farm income on the 'cattle other' and 'mainly sheep' systems in 2012 was €17,621 and €16,898 respectively, compared to €51,648 and €35,593 on dairy and tillage based systems. The average FFI on 'cattle other' systems before subsidies was -€3,172, once again emphasising the reliance of farm families

on grants and subsidies. The average FFI for the cattle and sheep systems in particular is well below the average agricultural income of €25,483 for 2012. The lower than average FFI and reliance of farm families on grants and subsidies suggests that farm families operating cattle and sheep farm systems do not receive a proportionate return for their labour. As discussed in Section 1.1, this suggests that there may be other factors that encourage farm families to remain on the land.

1.2.4 Farm Viability

The growing phenomenon of the reliance of farm households on non-farm income and the instability of the Irish economy serve to question the viability of farming and thus, farm households, in Ireland. For this reason, farms are categorised into a number of groups based on various viability criteria (Frawley *et al.*, 1996). Viability is assessed on the basis of a farm having the capacity to pay family labour at the average agricultural wage rate and being able to provide a 5% return on all non-land assets involved in the generation of the farm income (Frawley *et al.*, 1996). Farms that are not economically viable are usually sustained by the farm operator, another household member, or both having employment off the farm. The adoption of off-farm work by farm households is an important, well-recognised and growing phenomena in the EU (Kinsella *et al.*, 2002). Farms that are neither viable nor sustainable are classified as economically vulnerable. In 2012, 37% of farms were classified as economically viable, a decrease from 41% in 2011. Despite this, 33% of all farms were still considered economically vulnerable. Given their low FFI, farms specialising in beef production have the highest proportion classified as economically vulnerable (almost 40%), with only 27% considered viable enterprises. On the other hand, 71% of dairy farms and 74% of tillage farms were classified as economically viable in 2012 (Teagasc, 2013).

Due to the increasing pressure on farm incomes and growth in the number of vulnerable farms, the continued existence of many family farms cannot be maintained from farming alone. Farmers altering their behaviour in response to changing market forces, the fall in farm incomes and technological developments are being largely influenced by their cultural heritage (Van Der Ploeg *et al.*, 1986 ; Van Der Ploeg, 1990). One of the survival strategies of farm households in Ireland in response to these changes, instability, decline in farm income

and subsequent economic vulnerability, frequently involves the development of non-agricultural income from off the farm (Brick, 2005). Farm operators and/or other household members are being forced to reallocate their time between farm and non-farm markets. Off-farm employment has been crucial in allowing small holders to continue in farming, particularly on smaller holdings where there is a higher incidence of off-farm occupations (Hannan and Commins, 1992). However, against the backdrop of an ailing economy and growing unemployment rates, the number of farm households where the farmer and/or spouse worked off the farm declined for the fifth consecutive year in 2012. The number of farm households where the farm operator and/or the spouse were engaged in off-farm employment was 49% in 2012 compared to 51% the previous year (Teagasc, 2012; 2013). Though the number of farm household members engaging in off-farm work has declined due to the economic crisis in Ireland, ultimately this reallocation of labour by farm family members still has an effect on the allocation of free time.

In summary, agriculture is an integral part of the Irish economy though there has been a sustained decline in the number of farms since the 1980s, particularly in the West of Ireland where the decline is more pronounced. The decrease in the number of farms conceals the significant growth in farms of greater than 50 hectares to the detriment of farm holdings of 50 hectares or less. Specialist beef and sheep production are the most prominent farm systems in Ireland, while low density livestock farming is most typical in the West. Farm income is extremely volatile and a source of uncertainty for many farm families with farm incomes largely made up of subsidies or payments from the EU or the government of Ireland. The proportion of the farming population aged 55 years and over has increased year on year since 2000, and the West of Ireland has the highest proportion of farm operators aged 65 years and over. This overview of the agricultural system in Ireland serves to provide an understanding of family farming, particularly in the Western region where it is most unstable and thus, most susceptible to change. The changing structure of farming in Ireland has implications for the allocation of time of farm household members, providing motivation for this research.

1.2.5 The Common Agricultural Policy

Agricultural policies, in particular since Ireland's accession to the then EEC in 1973, have profoundly shaped the way in which land is managed and farmed and ultimately the way farm family members behave. When Ireland joined the EEC, the CAP effectively replaced national agricultural policies and consequently its rural development policies. Established in the 1960s, the primary objective of the CAP was to raise farmers' income above free market levels in the form of transfers through subsidies, thus ensuring the security of Europe's supply of affordable food. Other objectives of the policy directive included the increase of agricultural productivity and the safeguard and preservation of a large farming community (European Commission, 2007). The CAP was and still is essentially a farm policy and accordingly a rural development policy (European Commission, 2007).

Since its inception, the CAP has evolved to reflect the changing needs of both agriculture and society as a whole. From a rural development policy perspective, the Agenda 2000 reforms are one of the most substantial. These reforms were largely influenced by a strand of opinion which argued a social welfare case for continued state assistance to economically marginal producers, justified in terms of the need to retain a countryside occupied and managed by a large number of family farmers (Potter and Lobley, 2004). The Agenda 2000 reforms divided the CAP into two 'pillars', one encompassing market interventions and direct payment elements and a second comprising of supports for rural development, sustainability and environmental conservation. Subsequently, the reform process has been characterised by a transfer of payments from pillar I to pillar II with increased emphasis on rural development as the core of European agricultural policy. The motivation for the policy shift was articulated in the Cork Declaration of 1996, issued at the rural development conference in Cork under the Irish Presidency of the EU. The declaration stated that rural areas were "characterised by a unique cultural, economic and social fabric, an extraordinary patchwork of activities, and a great variety of landscapes (forests and farmland, unspoiled natural sites, villages and small towns, regional centres, small industries)" and advocated that "sustainable rural development must be put at the top of the agenda of the European Union" (The Cork Declaration, 1996, p. 1).

Following the Agenda 2000 reforms, measures to help strengthen the competitiveness and viability of the agricultural sector and to improve the quality of life and economic opportunities of those in rural areas were implemented. The measures included: support for investment to help farmers to modernise buildings and equipment; advanced vocational training for farmers wanting to improve their expertise in business management, technology, or new production; early retirement programmes facilitating the succession of farms to a younger generation; and support for the diversification of economic activities, both on and off-farm ranging from increasing the range of local products to the development of craft activities and agri-tourism[10].

In 2003, further fundamental reforms, with the aim of making the agricultural sector more market-orientated, were approved and introduced. The 2003 reforms, collectively known as the Fischler Reforms, introduced a new system of direct payments, known as the single payment scheme, under which aid is decoupled from or no longer linked to production. The aim of the single payment scheme is to guarantee farmers more stable incomes that affords them the opportunity to decide what to produce and in what quantities, safe in the knowledge that they will receive the same amount of aid. This also ensures that production is demand driven. In 1990 Commins and Marsden (1990) identified a pattern of land use developing throughout Ireland and the EU, whereby two types of farm structures were emerging. The first was a competitive-based agricultural structure with farms able to 'ride the market' and which will eventually be fully exposed to the world market. The second were semi-subsistence based farm structures, high nature value places in marginal areas, maintaining their reliance on substantial public investment and allocated roles such as resource managers of the rural economy. Potter (2006) and Thompson (2008) have since affirmed that Commins and Marsden' concept of a two type agricultural sector is very much prevalent in CAP thinking. In 2008 further changes were made, building on the reform package from 2003, such that all aid to the agricultural sector was decoupled by the end of 2012 (Eurostat, 2011).

Unsurprisingly, the development of the CAP has seen the agricultural sector and consequently rural regions go through profound change in the last number of decades. Full decoupling has meant that farm profitability relies on successfully responding to world

[10] Adapted from the European Commission (2007).

market conditions. A consequence of this is the restructuring of the agricultural sector away from family farms in favour of large production units. The decline in farm numbers and increasing farm size outlined in Section 1.2.1 suggests that this particular sphere of agricultural sector restructuring is well-established. Given the move to full decoupling, the operation of the technological treadmill and the existence of significant economies of scale in production, it seems inevitable that this trend will continue. Farm household members will invariably respond to these changes and changes in the market by altering their behaviour. Where operators work off-farm, they may choose to increase their off-farm hours to supplement their income or on smaller farms, operators may choose to reduce on-farm labour supply and divert labour resources to off-farm jobs or on-farm diversification. Alternatively, farmers may choose to leave the land, contributing to a decline in the number of farm families and the depopulation of rural regions.

If one looks at the experience of New Zealand following the phasing out of agricultural subsidies in the 1984 agricultural reforms, it may be possible to get some insight into how the agricultural sector in Ireland will react to full decoupling or even a complete reduction of agricultural supports. Following the removal of all agricultural based subsidies in New Zealand, though prices and incomes fell initially, they eventually recovered and, in the case of dairy farmers, exceeded their old level. The main effect was that farmers became more responsive to the market, coping by cutting costs, increasing revenue and restructuring debt (Lattimore, 2006). Employees on farms were laid off and unpaid work increased as the burden of farm work shifted to the family. Farm operators sought off-farm employment while some farms diversified and began to seek alternative and non-traditional sources of revenue such as farm tourism and accommodation (Jardine, 2010). Facilitating the transition from a heavily subsidised industry to a market based production industry, the government of New Zealand put in place a number of transition programmes which inevitably led to a smaller decrease in farm numbers than was originally envisaged (Gouin, 2006). One of those programmes included a Special Assistance to Farming programme whereby farmers on the margin and in financial jeopardy were initially offered grants, though an ‘exit package’ was subsequently introduced to help non-viable farmers who had to leave farming altogether (Gouin, 2006). One of the lessons learned from New Zealand’s agricultural reforms is that, with the right transition programmes, farmers can prosper without substantial state assistance (Rae *et al.*, 2003; Lattimore, 2006; Jardine, 2010). Newby (1988, p. 119) outlined that “both

neo-classical economists and classical sociologists believe that the family farm is destined to be eliminated by the forward march of agrarian capitalism". However, farming remains a family-centred industry in New Zealand even after such sweeping reforms (Gouin, 2006; Jardine, 2010). The experience in New Zealand suggests that the family farm based agricultural sector in Ireland is sustainable, though CAP reforms may result in a reduction of subsidies and payments to farm families on which they are heavily reliant.

1.3 Research Objectives and Motivation

The overarching goal of this thesis is to expand our knowledge and understanding of the time allocation of farm household members in the West of Ireland. This is done through the design, execution and analysis of a time use diary survey and accompanying individual and household questionnaires. Following this, there are a number of specific research objectives, which are listed and discussed below. The research objectives are:

1. To build a profile of time and task management of farm family members in the West of Ireland, describing the basic structure of time use of farm household members over the course of a year.

2. To explore the factors that influence the participation in and the number of hours dedicated to civic engagement and voluntary activities among farm household members in the West of Ireland.

3. To investigate the factors that influence the participation in and the number of hours dedicated to active, passive and social entertainment leisure activities among farm household members in the West of Ireland.

In relation to the first objective, there is a lack of micro-level data on farm household members in Ireland, particularly data which incorporates variables on a wide range of household characteristics. Little is known about their daily experiences, including how they spend their time on an off the farm, as there is no time use data in Ireland relating specifically to farm operators or farm households. As a result, there has been little or no analysis of the factors that affect their allocation of time. To date, a limited number of time use surveys have

been undertaken in the Republic of Ireland, only one of which was nationally representative. Indeed, the need for time use studies with better aims, more pointed approaches, and more specialised interest in particular activities, collected on a regular basis, has been emphasised (As, 1978; National Statistics Board, 2003; McGinnity *et al.*, 2005). In terms of data collection, this study addresses a gap in the literature regarding the need for the collection of time use and micro-level data on farm households in Ireland. It also responds to Hirway and Jeyalakshmi's (2007) report that there exists scope for small-scale special-purpose time use surveys that focus on specific population groups, for example the agricultural household.

It is well established in the literature that a need exists for development and public policy interests in Ireland and in other advanced, industrialised nations to better understand the role of community agency and local relationships in the process of rural community and economic development (Douglas, 1994; Commins *et al.*, 2000; Brown and Swanson, 2003; Lee, 2003; Hautekeur, 2005). Collective action and strong community relationships are vital to protecting, retaining and maintaining rural communities (Wilkinson, 1991; McDonagh, 2001; Moseley, 2002; Flora and Flora, 2003; Luloff and Bridger, 2003; Brennan *et al.*, 2005; Theodori, 2005). As indicated in Section 1.1, Ireland is unique in that its social networks are well preserved and integrated and it has a farming community that is inextricably linked to the rural community. Thus, a study providing an in-depth assessment of how farm household members organise their daily lives can serve to inform policy-makers on how to proceed with rural development interests.

Formal voluntary work, through organisations, and informal volunteering, by helping other households, plays an important role in the delivery of socially important goods and services by supplementing the basic services of the welfare state in a functioning civic society. This is the focus of the second objective. Ireland has a rich tradition of volunteering, yet there are a limited number of studies that have examined why this is so (Houses of the Oireachtas, 2005). Internationally, studies have been undertaken which examine the factors that affect an individual's decision to volunteer and the choice of how many hours to volunteer. This thesis extends on previous work in this area in three key ways. First, the time use diary survey and accompanying individual and household questionnaires have been designed specifically for the collection of data relating to civic engagement and volunteering. Thus, it permits an examination of many personal, socio-demographic and farm related characteristics that may

influence participation in civic engagement and voluntary activities, factors that have not been examined in previous research. Identifying and understanding the social processes that underpin farm household members' voluntary and civic engagement patterns in rural communities is important for public policy programs that seek to improve the well-being of the rural population and promote rural sustainability. Furthermore, for voluntary and community organisations, a better understanding of who is likely to volunteer, and among volunteers, who is likely to devote substantial amounts of time to this form of unpaid work, is central to improving their ability to develop effective and efficient volunteer management strategies. Second, volunteers from rural areas, specifically volunteers from farm households, have not been studied in isolation and very little work has been done to try to distinguish this group of volunteers from other groups. Third, almost all previous work has focused on formal volunteers, those who volunteer through recognised organisations, to the exclusion of a very important group, particularly with respect to social capital, informal volunteers. Informal volunteers are those people who help out their friends, family members and neighbours with their daily activities of life and are considered explicitly in this thesis using time use data.

Finally, the availability and use of leisure time is an important dimension of social well-being and is associated with benefitting different groups of people in a variety of ways. Participation in recreational activities enables people to develop their skills, talents and knowledge, and can provide them with a sense of identity and personal autonomy. Activities such as sports and active leisure can enhance people's health and contribute to a reduction in physical and mental health problems (like high blood pressure and depression). By supporting the formation of community networks and preventing social isolation, some leisure activities play an important role in the quality of life of the aging population (Kelly and Ross, 1989; Mannell, 1999; Tinsley *et al.*, 2002). For working people, participation in leisure activities can be a means of coping with work related stress (Trenberth and Dewe, 2002). Conversely, activities such as gambling and drug and alcohol abuse can have negative effects on physical and mental health, while activities such as graffiti and vandalism can detract from community well-being. Within this context, understanding time allocation patterns for leisure activities has broad ramifications for societal well-being. For example, if people are disadvantaged both educationally and in their leisure choices, the polarization of various socio-economic groups within a society will increase with regard to those who have high education, better incomes, good health and more rewarding past-times and to those who

do manual work, have poor health and passive leisure. In turn, these health problems impose social and monetary costs on society because of lowered productivity in the marketplace and increased health costs.

1.4 Structure and Overview of Thesis

The structure of this thesis is as follows:

Chapter 2 presents an overview of the literature relating to the economic models of household behaviour that underpin the study of the allocation of time of household members. The main characteristics and principal assumptions of neoclassical unitary models of household behaviour and the more recent approaches to household behaviour that treat each household member as an individual with a distinct set of preferences are reviewed. A key objective of Chapter 2 is to specify the most appropriate theoretical framework upon which to empirically model the allocation of time of farm household members. Thus, Chapter 2 concludes with a specification of the agricultural household model, based on the unitary model of household behaviour. This is the theoretical framework used throughout the thesis to model the time allocation decisions of farm household members.

Chapter 3 introduces the topic of time use research. It outlines the development of time use as a tool for research and describes the various instruments available for the collection of time use data. In addition, it summarises the diverse fields of utilisation of time use data by way of a literature review. The challenges when attempting to analyse time use data using econometric methods are outlined and an overview of the econometric models frequently used when dealing with time use data is presented. Finally, the caveats or limitations of time use studies in measuring and monitoring participation and levels of participation in various activities are described and the reliability and validity of time use estimates are discussed.

Chapter 4 presents a detailed discussion of the development and evolution of the survey instrument used in this thesis and the implementation process. It includes a detailed summary of the specificities of the survey instrument, the options available for each design consideration and the justification for each design choice. This is followed by an overview of the questions contained in the individual and household questionnaires and the motivation for

the inclusion of each question. The lengthy process of pre-testing and piloting the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey* is described and the changes that were made to the survey instrument before its final administration are outlined.

Chapter 5 presents some sample descriptive statistics from the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey*. Reflecting the nature of the survey, the chapter analyses the data at both the individual and the household level. The challenging process of preparing and organising the data for analysis is described and summary information on the response rates is presented. Also included in this chapter is the distribution of diaries by day and by season, as well as a discussion of the problems encountered by respondents when completing the diaries. A demographic profile of the farm household members who completed the time use diaries and accompanying questionnaires is presented and the characteristics of the households and of the farms are outlined.

Chapter 6 presents an overview of the typical patterns of time use of farm household members in the West of Ireland. It gives new insight into how much time Irish farm household members spend on various activities and what they do with their free time. It also permits a better understanding of the role of gender in shaping daily time use and activity patterns. Much of the analysis in Chapter 6 consists of cross-tabulations of key variables in an attempt to illustrate potential relationships. Cautious comparisons between the results from the *Time Use of Farm Household Members of Farm Household in the West of Ireland 2011/12 Survey* and the first national results on time use in Ireland from the Irish National Time Use Survey conducted in 2005 are made.

Chapter 7 presents statistics in the context of a discussion of the differences in time use patterns by age and a range of socioeconomic characteristics such as education, household income and off-farm work status. It also investigates the differences in time allocation across family characteristics such as marital status, the presence and the number of children, and by farm size. The final dimension of time use that is considered in Chapter 7 is the relationship between the time use patterns of farm household members and the distance they live from the nearest village or town, the size of the community they reside in and the length of time they have resided or farmed in the area or community. This chapter presents a detailed analysis of time use patterns across farm household types. Though the analysis in this chapter is

relatively basic and necessarily descriptive in nature, it nonetheless identifies areas that merit further research and thus provides the basis for the analysis in subsequent chapters and for future research.

Chapter 8 investigates the factors that influence the participation in, and the number of hours dedicated to, civic engagement and voluntary activities among farm household members in the West of Ireland. This chapter contributes to the existing literature by examining the factors that influence farm household members' participation in informal as well as formal voluntary activities. It includes a comprehensive review of the empirical literature, from Ireland and internationally, that attempts to explain the motivations for participation in civic and voluntary activities. Following this, the empirical results of the bivariate analysis, the multivariate logistic regression analysis and the double-hurdle models that are used are presented. The chapter concludes with a discussion of the results and outlines the possible policy implications of the findings.

Chapter 9 examine the factors that influence the participation in, and the number of hours dedicated to, various leisure activities among farm household members in the West of Ireland. It also investigates the diversity of participation in various types of leisure activities, namely active, passive and social entertainment. A body of literature pertinent to the understanding of people's use of leisure and involvement in physical activity is reviewed. This is followed by a descriptive analysis of the data relating to time allocated to leisure activities. Next, the empirical results of the bivariate analysis and double-hurdle models used in the analysis are presented. Finally, the results are discussed and the possible policy implications of the findings are outlined

Chapter 10 presents a summary of the key issues and findings from each chapter as they relate to the overall research goals as stated in this chapter. The limitations of the methodology and analysis are then discussed. Following this, potential avenues for future research using the data that was collected in the single-purpose *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey* are set out. Finally, a number of policy related issues are discussed and the outputs to date from the research undertaken in this thesis are listed.

2. An Economic Framework for Modelling Time Allocation

> "Different constraints are decisive for different situations, but the most fundamental constraint is limited time"
>
> (Becker, 1965)

2.1 Introduction

Neoclassical microeconomic theory focuses mainly on explaining behaviour at the level of the individual (Dwivedi, 2006). However, individuals live together in households with family members or other unrelated people and membership of the household confers rights and obligations that may influence the decisions that the other persons in the household make. This has been recognised since the work of Gary Becker (1965), who introduced time to the economic analysis of household behaviour. Becker's (1965) original model, and a subsequent variant by Gronau (1977), provide a general framework for modelling time allocation among market work, home production and leisure. Becker (1965) considers the household as a single decision making agent, with a single pooled budget constraint, maximising a single utility function that includes the consumption and leisure time decisions of every family member i.e. the so-called 'unitary model'. Over time, this view has been increasingly challenged, both from a theoretical and an empirical viewpoint, by those who argue that it is too simplistic.

The sections that follow review the main characteristics and principal assumptions of neo-classical unitary models of household behaviour and the more recent approaches to household behaviour that treat each household member as an individual with a distinct set of preferences. An overview of the key debates in the literature with regard to the most appropriate framework for modelling the allocation of time of farm household members is also presented. The main criticisms of the neoclassical household economic models are also outlined. A review of the theories of the household shows that no particular approach is sufficiently advanced so as to dominate the field of household economics, though the case is made for accepting a variant of the unitary model as the theoretical model of decision-making in households to frame the analysis of time use of farm household members in this thesis.

Finally, the agricultural household model, based on the unitary model of household behaviour, is specified.

2.2 Unitary Models

According to neo-classical consumer choice theory, individuals follow a deliberate process when making decisions in which they weigh the expected benefits against the costs of each option and ultimately choose the option that produces the most benefits or in other words, maximises their utility, subject to a set of constraints. It is therefore convenient to assume that consumer choice theory also applies at a household level, except that the basic unit would be the household rather than the individual. Applying this logic, the central assumption of the unitary model is that all household members jointly make decisions to maximise their collective interest. There is a common household preference structure and a common family budget, implying that the household acts as a single economic agent maximising a single utility function. Such households are characterised by the pooling of resources, the absence of conflict and overall collective utilities which enable complete social harmony (Mattila-Wiro, 1999).

Samuelson's (1956) 'consensus' model and Becker's (1965; 1974; 1976) 'altruistic' model offer two different theoretical underpinnings for using the single utility function to represent the entire household and the preferences of all members. In Samuelson's (1956) consensus model, the household utility function is a compromise between family members. He argues that, because 'blood is thicker than water', families, unlike other collectives, can be assumed to have the welfare of all their members in mind when making decisions. In other words, the family acts as if it were maximising a joint welfare function reached by consensus among individual household members because they care about one another. Samuelson did not, however, explain how the family achieves a consensus regarding the joint welfare function, or how this consensus is maintained.

Becker's (1974; 1976) altruistic models address this issue by providing an account of how resources are distributed within the family. Becker argues that household preferences can be modelled as the preferences of the family head who is assumed both to control the bulk of

family resources and to act altruistically. Becker recognised the possibility of divergent interests within the family but argued, in his 'Rotten Kid' theorem, that even if other family members or 'rotten kids' are selfish and want to behave in their own interests, because the altruistic parent can adjust transfers, this is sufficient to induce the selfish kids to act in an apparently unselfish way. The resulting distribution is the one that maximises the altruists' utility function subject to the family's resource constraint.

2.2.1 Beckerian Theory of the Allocation of Time

In a series of seminal articles during the 1960's and 1970's, Gary Becker (1965; 1974; 1976) conceptualised an alternative to traditional neoclassical consumer theory, the New Household Economic Theory. The most important contribution of Becker's theory is the introduction of time to the economic analysis of household behaviour. He assumed that the allocation of time, a scarce resource, between work and non-work activities is the result of a utility maximisation decision, itself determined by the cost of each activity and subject to constraints on income and personal preferences. In Becker's basic household production model, time and market goods are combined within a 'household production function' to produce an optimal bundle of basic commodities. Depending on the preferences of the household and the production technology used, these basic commodities (e.g. warmth, nutrition or health) directly enter the household's utility function. Market goods and time are therefore not desired for their own sake, but only as inputs into the production of these basic commodities which are sources of utility for individuals. The difficulty is that these basic commodities or outputs are not directly observable, though it is possible to have information on the time and market inputs that have gone into the production process. Subsequently, variants of this framework have been introduced with more easily measured variables.

The introduction of time to the economic analysis of household behaviour reduces the problem of consumer choice to a time allocation problem: how many hours have to be worked in order to purchase market goods and how many hours to devote to making basic commodities and consuming them? Time can be converted into market goods by spending more time at work than at consumption (non-work time). Time spent at work is reduced if real wage rates decrease, and is correspondingly increased as real wage rates increase,

making the relative price of non-work time more expensive. A rise in earnings increases the opportunity cost of time used in consumption and the relative prices of commodities change, so that prices of more time-intensive commodities rise more than those of less time-intensive goods (Becker, 1965). At the optimum, the marginal utility of consumption of a given basic good is equal to its shadow price, which includes marginal inputs of goods and the marginal value of the time to make the basic commodity. Then, each basic commodity is produced to the extent that the marginal rate of substitution between different inputs is equal to the ratio of its input prices, which in this case are the wage rate and cost of goods.

A widely cited criticism of the Beckerian framework is that of Robert Pollak and Michael Wachter (1975). They argue that because outputs from the production process, the basic commodities, are not directly observable, it is impossible to separate preferences from the household technology in a reduced-form demand equation. Households with different tastes and the same technology will select different commodity bundles and it will be impossible to deduce whether this is caused by their preferences or their household production technology. The only way to make prices of basic commodities tractable is to adopt the strong assumptions that the household production function exhibits constant returns to scale and that there is an absence of joint production. Joint production arises when a production or activity produces two or more 'outputs'. An example is the process of a clean house. If an individual derives direct utility from cleaning ('process benefit'), two 'outputs' or 'commodities' enter the utility function: 'clean house' and 'time cleaning'. It is argued that constant returns to scale is an unrealistic hypothesis in the context of household production and that household production is full of activities that give direct utility (Pollak and Wachter, 1975). With direct utility derived from household work, household members will spend more time on different activities than they would without direct utility. Therefore, the assumption that there is some jointness in the activities that household members do seems warranted. There is evidence that joint production is also evident in market work, which in some cases is enjoyed *per se* (Juster and Stafford, 1991), though this has not stopped labour economists from investigating labour supply. Therefore, the joint production problem should not do the same to housework.

2.2.2 Gronau's Household Production Model

Addressing the deficiencies of the Beckerian framework, Gronau (1977) narrowed the scope of household production to household, leisure and market activities. Gronau's (1977) classical household production model is one of the most widely cited variants of Becker's theory and is now the cornerstone in household production theory. Gronau extended the conventional labour supply model of consumption and leisure by incorporating household production, an activity that requires human labour. He emphasised the need to deal more explicitly with time as an input in the production of goods and services. Gronau's original model is that of one person who allocates their time to leisure, home production and market work. He makes an intuitive distinction between work at home (i.e. home production) and leisure, in that work at home (like work in the market) is something one would rather have somebody else do for one (if the cost was low enough), while it would be almost impossible to enjoy leisure through a surrogate. Thus, Grouau's central assumption is that work at home is time-use that generates services which have close market substitutes, while leisure has only poor market substitutes. However, this assumption of perfect substitutability between home-produced commodities and market goods has been the subject of some discussion as it will often be the case that some of the time people spend on housework can partly be considered as leisure i.e. joint production.

This observation is the background for Graham and Green's (1984) extension of the Gronau model to a two wage-earner household that introduces joint production between home production and leisure. In this case some of the time used in household production gives direct utility to the household members. Implicitly, this extension modifies the strong assumption of perfect substitutability between market goods and home production and brings the model much closer to a realistic description of home production decisions. As an example, consider a parent whose hourly wage exceeds the market price of one hour of child care. In the Gronau model the parent has two options to provide for child care. The first option is to take care of the child him/herself at home. The second option is to earn money in his/her job and purchase child care on the market. In the model without jointness, the parent chooses the latter option. In the model with jointness, however, he/she will choose to take care of the child him/herself if a sufficiently large share of the time spent on this activity is valued as leisure. Graham and Green (1984) use a Cobb-Douglas specification of the household

production function along with a specification of the jointness function that allows the household's optimisation problem to be solved analytically. They estimate an equation for the home production time for the spouse and provide estimates for the value of home production by putting the hours that spouses spend in household production through a transformation function in which part of the hours are subtracted as pure leisure. They show that their parameter estimates are sensitive to the assumptions and constraints on the household technology and find substantial jointness between home production time and leisure.

Kerkhofs and Kooreman (2003) demonstrate the limitations of Graham and Green's approach by noting that the introduction of the joint production functions into the analysis causes the reintroduction of some elements of the household utility function into the otherwise technical relationship, which in turn creates problems. They illustrate that in this formulation, the capability to separate the effects of the joint production function depends on the fact that joint production functions are individual specific but the production is household specific and contains cross-effects. They showed that even in the case with information available on both time-inputs and market goods used in household production, identification of the joint production is difficult. If the household contains only one adult, identification is not attainable in the case of joint production.

At the theoretical level, it has been argued that the unitary model is not grounded on methodological individualism, the cornerstone of microeconomics (Chiappori, 1992). Some authors, Haddad and Kanbur (1989; 1991) for example, have criticised the unitary model for its inability to analyse intra-household inequalities, economic policies which target certain household members only, or changes in household composition (e.g. due to separation, divorce, the decision of a youth to leave the farm, etc.) which may lead to incorrect welfare implications (Apps, 1981; Apps and Rees, 1988; Lundberg, 1988). When individuals can follow their own policies even when they are constrained by the actions of other family members, unitary models are inadequate to describe their behaviour and game theoretic models are required.

In numerous empirical studies, the family income pooling hypothesis has been strongly rejected (Manser and Brown, 1980; McElroy and Horney, 1981; Lundberg and Pollak, 1996; Browning and Chiappori, 1998). However, contrary to the findings of these studies, Hallberg

(2004) found the fundamental assumption of a common utility function of the household to be correct, in Sweden at least. Hallberg's study confirmed the results of other studies by Aronsson *et al.* (2001) and Nyman (2002) which tested income-pooling in Sweden and found indications that Swedish couples do pool their sources of income into a family budget. Nyman (2002) also indicated that the source of income was of little importance for personal consumption and spending. Similar to the findings by Schultz (1990), Thomas (1990), Bourguignon *et al.* (1993), Fortin and Lacroix (1997) found that the income pooling hypothesis could be rejected for most sub-groups except for couples aged between 24 and 35 with no pre-school children. This adds weight to Hallberg's (2004) argument that it is possible that some household types more than others behave according to the unitary model. It is also worth noting that much of the theorising about family farming in advanced 'capitalist' societies has been based on unitary notions of the farm family, where internal consensus is taken for granted and the coincidence of farm and family is ignored or considered irrelevant (O'Hara, 1998). Thus, the unitary model should not be excluded from consideration in the context of this thesis.

2.3 Non-Unitary Models

In the years since Becker's (1965) paper was published, economists have become increasingly uncomfortable with models that rely on a shared household utility function instead of individual utilities. Various modelling approaches have been formulated which make the assumption that in multi-person households, decisions are made by individuals who have their own preferences and their own constraints. Generally known as bargaining and collective models, these models encompass certain factors that cannot be observed with the unitary model of household behaviour. For example, they permit one to examine how an increase in the income of one household member can affect the well-being or consumption of another household member. These models are also used to examine the influence of external factors such as social or institutional variables on household behaviour (Phipps and Burton, 1996)

2.3.1 Bargaining Models

In contrast to unitary models, bargaining models apply the tools of game theory to their analysis of the household and allow one to begin with individual preferences rather than household preferences. Another distinction is that in the bargaining approach, the individual with control over various income sources influences resource allocation within the household, whereas in the unitary models only the pooled income of household members is relevant. Two distinct frameworks for these models can be identified in the literature: cooperative and non-cooperative bargaining models.

Cooperative Models

In its simplest form, two people cooperate in order to improve the position of each other compared to a situation in which these individuals do not cooperate. Each person has their own interests, preferences and utility function and there is no dictator in the household: all conflicts are resolved using the bargaining process. The bargaining problem can be resolved in different ways, but the solution depends on the bargaining power of each participant. This power is affected by social and institutional variables e.g. gender, social class or income, as well as by the resources controlled by each person in the household. What makes the cooperative bargaining models work is the existence of a 'threat point', the point at which the parties may leave the unit (e.g. divorce, where the unit is a marriage). The level of the threat point for each member is determined by the member's fallback position, which translates into his or her bargaining power in the household.

Applying Nash bargaining game theory to household behaviour, Manser and Brown (1980) and McElroy and Horney (1981) modelled marriage as a two-person cooperative game in which the husband and wife have different preferences. In such a situation, the threat point is the termination of the marriage (divorce). When the potential gains from outside the marriage are higher than the benefits for the marriage, the spouses decide to divorce. A criticism of this model is that the assumption of divorce as a threat point may be unrealistic for minor disagreements (Phipps and Burton, 1996). In another model, Lundberg and Pollak (1993) propose a 'separate spheres' bargaining model which views marriage as a cooperative game.

The model differs from the 'divorce threat' model in two ways. First, the threat point from which cooperative Nash bargaining proceeds is not divorce but a non-cooperative equilibrium within marriage. Thus, the threat point is internal to the marriage rather than external. Secondly, the non-cooperative equilibrium, although it is not Pareto optimal, may be the final equilibrium because of the presence of transaction costs.

While these structural models using the Nash bargaining cooperative approach differ in some respects, they all generate household outcomes that are Pareto-efficient, at least under symmetric information and omit household production entirely (Manser and Brown, 1980; McElroy and Horney, 1981; Chiappori, 1988; Kooreman and Kapteyn, 1990; McElroy, 1990; Fortin and Lacroix, 1997). For the analysis of a social institution like the family, this framework seems more natural and promising than the non-cooperative approach based on Nash equilibrium (Ulph, 1988), which leads to outcomes that are generally Pareto-dominated.

Non-cooperative Model

Some authors have argued that the threat point in the static cooperative model, divorce for example, is unrealistic (Phipps and Burton, 1996). In response, they have formulated non-cooperative game theory models in which it is presumed that two-member families cannot enter into binding, costlessly enforceable agreements with one another. Without binding agreements, much of the motivation for assuming Pareto optimality vanishes, therefore non-cooperative models neither assume nor imply that all outcomes are Pareto optimal (Lundberg and Pollak, 1994). In a non-cooperative game, each player's strategy is a 'best response' to the other player's strategies and an equilibrium point, the Nash equilibrium, is reached. Non-cooperative game theory does not, however, model the assignment of strategies to players and in games with multiple Nash equilibria, there may be no obvious way to choose among them.

In these static models, the different threat points have very different behavioural implications. In the cooperative model, a change in the distribution of resources within a marriage, which does not change the total level of resources outside the marriage, does not change behaviour.

However, a similar change in the non-cooperative model changes partners' relative bargaining positions and, therefore, affects behaviour (Konrad and Lommerud, 1995; 2000).

2.3.2 Collective Models

Originating from the Nash bargaining framework, the collective models of household behaviour are generally assumed to have two main characteristics: firstly, each decision maker is assumed to have their own unique set of preferences and secondly, outcomes of intra-household allocations are only assumed to result in Pareto efficient outcomes (Chiappori, 1988; 1992; 1997). Common to collective models is the idea that, unlike unitary models where income is pooled, control of market income may influence decision-making power within the household and hence observable behaviour. Individualistic behaviour can thus be cooperative or non-cooperative; no particular solution is imposed. Thus, it would seem possible to treat time allocation in the context of collective models of household behaviour, as collective models would make the study of power relations within the household possible with regard to time allocation. However, there are a number of difficulties with the incorporation of expanded time use categories in these models, which makes the traditional unitary approach more suitable for the analysis of time-use.

Chiappori (1988; 1992) was the first to formulate the efficient collective model. Apps and Rees (1997) and Chiappori (1997) pointed out a shortcoming of this original model, the absence of household production, and investigated the possibility of extending collective models to take household production into account. The problem is that introducing household production with the bargaining mechanism makes many of the effects intractable. For example, even in the case of allocation of time to market work and leisure, the sharing rule between spouses cannot be fully recovered. By introducing an extra dimension to this problem, the model is not tractable except under very strong and implausible assumptions. Moreover, the household production models reduce the production decision of the household to be contingent on wage rates and production efficiency. By explicitly considering bargaining questions, the preferences of the spouses are introduced back into the decision-making and this complicates the model further.

In standard models without household production, the sharing rule can be recovered up to an additive constant. In Apps and Rees' (1997) enlarged model, this is not possible. This is because time can be divided between three different activities so leisure cannot be deduced solely from the labour supply. Apps and Rees (1997) showed that the set of restrictions, which allows the recovery of partial derivatives of the sharing rule, are first, that household production is linear homogenous and, second, that demands for leisure are independent of the price of the domestic good. In his response to Apps and Rees' contribution, Chiappori (1997) showed that in the case when a household produced good is assumed to be tradable, the sharing rule parameters can be recovered up to an additive constant. In the most natural case, where the household produced good is non-tradable, Apps and Rees' result of the impossibility of recovering the sharing rule still holds (Chiappori, 1997).

The collective model has been subject to extensive empirical testing - see for example Browning *et al.* (1994), Fortin and Lacroix (1997), Aronsson *et al.* (2001). Estimating male and female leisure demands, the household production function and the sharing rule parameters using the Swedish Survey of Household Market and Non-Market Activities, Aronsson *et al.* (2001) could not reject the unitary model or the restricted model when using 1984 data (n=326) but both models were rejected when data from 1993 (n=338) was used. Incorporating household production into collective models is problematic as is evident from Aronsson *et al.* (2001) contradictory results. Indeed, there is no generally accepted consensus that the collective model should be rejected in favour of the unitary model, suggesting that there is a clear case for incorporating bargaining aspects of household decision-making into models with household production. However, the extra complications that possible enlargements would introduce suggest that the traditional unitary model with household production is easier to implement and is therefore the framework that is followed in this thesis.

2.4 Choosing a Theoretical Framework

The household production models in this chapter were introduced to provide a theoretical framework from which to conceptualise the time allocation decisions of farm household members and the forces that affect these decisions. Household production theory is a

powerful ally in the research of time use and although the Beckerian household production function framework has been criticised as being fundamentally unobservable, it serves as a good heuristic tool and represents the most natural way to model time allocation within households, particularly farm households. It is the most widely used theoretical framework in the analysis of the family, not only in the empirical analysis of household labour supply (see, e.g., Blundell and Walker, 1986), but also for consumption behaviour (Browning and Meghir, 1991; Banks *et al.*, 1997; Blundell and Robin, 2000).

Although the bargaining and collective approaches are an appealing way of modelling household behaviour, the explicit decision making of the spouses will complicate the model and in many cases make the model intractable. Bargaining models are frequently used by economists examining the decisions of couples who do not have children (Lundberg and Pollak, 1996). In a household without the presence of children, cooperative behaviour will only affect the welfare of the two adults involved, and therefore they should be able to live satisfactorily with the outcome. However, once they have children, threats to become uncooperative have adverse implications for the children and are not in their best interest. This fuels Huffman's (2004) scepticism of the applicability of a bargaining model to agricultural household members' time allocation because he notes that children will, most generally, be present. Hence, bargaining is likely to be detrimental to welfare in the long term.

The unitary model, compared to alternative models, is somewhat less demanding in terms of the data required, as the non-unitary models require much more detailed, and hence costly, data. For example, they require that individuals in the household be independently interviewed, that sensitive information exploring the equality and vulnerability of the respondents is collected and that 'fair share' questions examining how physical and financial resources are divided up be included. Unfortunately, due to time and budget constraints, it was not viable to collect such data for the purpose of this thesis.

A key issue that separates the neoclassical unitary model from non-unitary models is the treatment of income: in the unitary model, only data on pooled family income is necessary but in the bargaining and collective approaches the individual level wage rate and, as already noted, information on who has control over the various income sources, is required. Individual-level wage rates are particularly difficult to collect in relation to farm household

members as a large proportion of farm income is in the form of lump sum grant and subsidy payments. The pooled or shared income data at the household level required for the unitary model is relatively straightforward to obtain. It should also be noted that in Ireland, it is the case that some form of income sharing or pooling system, whereby both partners in the household have access to the money earned and received in the form of grants and subsidies, can be found in an overwhelming majority or Irish families (Rottman, 1994; Daly and Leonard, 2002). The unitary approach also has the advantage of simplicity; results derived for single consumers/workers can be straightforwardly extended to the family situation. Thus, for the reasons outlined above, the agricultural household model considered next in Section 2.5 is based on the unitary model of household behaviour.

2.5 Specification of the Theoretical Model

This section provides an overview of the theoretical model relating to the time allocation decisions of farm household members used in this thesis. Agricultural household models have been used for more than two decades to motivate empirical studies of the allocation of time of farm households (Benjamin and Kimhi, 2006). Time allocation categories of farm household members include farm, off-farm and household work, as well as leisure time. Hence, based on the theoretical constructs initiated by Becker, most studies using agricultural household models assume a unitary model of household utility maximisation over consumption and leisure by a single farm family composed of an operator and a spouse, subject to time and budget constraints (Singh *et al.*, 1986). The unitary model is important as it sets the scene for analysing the important trade-offs between time spent in different activities. Huffman (1991) provided the most common specification of such models.

Following Huffman and Lange (1989), Tokle and Huffman (1991), Huffman (1991) and Huffman and El-Osta (1998), a farm household with two household members, the farm operator o and other household member m [11] is considered. The farm household's preferences are represented by a common utility function i.e. a unitary household utility function U. Households derive utility from the consumption of goods c, the hours of leisure for the farm

[11] This may be the spouse/partner of the farm operator or their parent, sibling or adult child.

operator and other household member T_l^i where $i = o, m$, and the stock of human capital by the farm operator and other household member v^i, where $i = o, m$. We extend this to include other household and area characteristics n such as household size, number of children, distance from town or village, etc. These factors are assumed to be exogenous to current household consumption decisions. Thus, we can formally represent the utility function as:

$$U = U(c, T_l^o, T_l^m, v^o, v^m, n) \tag{1}$$

where $\quad c = c_{mkt} + c_{hh}$

and consumption of goods c is composed of goods purchased from the market c_{mkt} and household produced goods c_{hh}. As discussed earlier, the much used and controversial assumption that market goods and household goods are perfect substitutes is made. In the model, farm household production occurs in accordance with the technology described by:

$$Q_f = Q_f(T_f^o, T_f^m, x, v^o, v^m) \tag{2}$$

where T_f^o and T_f^m are the hours dedicated to farm work by the farm operator and the other household member and x are the purchased inputs including hired labour.

In the model, $\bar{T}$ is total time endowment for the farm operator and the other household member (e.g. 24 hours on a daily basis) which can be allocated to leisure T_l^i, farm labour T_f^i or off-farm labour supply T_{of}^i. Time allocated to off-farm labour supply by the farm operator and the other household member can be zero or greater than zero i.e. the individuals in question may not partake in off-farm work. This is consistent with the fact that a significant share of individuals in our sample report no participation in off-farm employment (mainly the farm operator). Thus, each member of the household has a personal time constraint:

$$T = T_l^i + T_f^i + T_{of}^i \qquad i = o, m \tag{3}$$

where $\quad T_{of}^i \geq 0$

Consumption is constrained by household income which is composed of: (i) off-farm labour income $\left(\sum w_{of}^i T_{of}^i\right)$, where w_{of}^i is the hourly off-farm wage rate earned by individual i, (ii)

net farm income $Q_f\left(T_f^o, T_f^m, x, v^o, v^m\right)$, and (iii) other household non-labour income R including income from farm subsidies. Thus:

$$c = \sum w_{of}^i T_{of}^i + Q_f(T_f^o, T_f^m, x, v^o, v^m) + R \qquad i = o, m \qquad (4)$$

The off-farm wage rate function W_{of}^i describes the market labour demand for the off-farm wage function facing individual i. It is assumed that W_{of}^i is a function of individual i's stock of marketable human capital v_i and local labour market conditions ϕ, such that:

$$W_{of}^i = W_{of}^i(v_i, \phi) \qquad i = o, m \qquad (5)$$

Thus, given the above, the budget constraint can be rewritten as:

$$\sum w_{of}^i T_{of}^i + Q_f(T_f^o, T_f^m, x, v^o, v^m) + R - c = 0 \qquad i = o, m \qquad (6)$$

or

$$I = \sum w_{of}^i T_{of}^i + Q_f(T_f^o, T_f^m, x, v_o, v_m) + R = c + W_x x \qquad i = o, m \qquad (7)$$

where I is the household's full income. This I, by definition, represents the household's total economic resources in terms of the farm operator and other household member, their human capital, and income from assets owned (Thomas and Senauer, 1993). Equation (7) establishes the requirement that household's full income I should equal its total expenditure.

The conditions for optimal allocation of time by the farm household are obtained by maximising utility subject to the constraints on time, farm household productivity and income as defined by Equations (3) and (6). Equivalently, the optimality conditions can be obtained by first forming the following Lagrange function L:

$$L = U(c, T_l^o, T_l^m, v_o, v_m, n) \qquad (8)$$

$$+\gamma\left[\sum w_{of}^{i}T_{of}^{i}+Q_f(T_f^o,T_f^m,x,v_o,v_m)+R-c\right]$$

$$+\lambda^o\left(\bar{T}-T_l^o-T_f^o-T_{of}^o\right)+\lambda^m\left(\bar{T}-T_l^m-T_f^m-T_{of}^m\right)$$

where γ, λ_o and λ_m are Lagrange multipliers for the marginal utilities of farm operators and the other household members income and time, respectively. The next step is to maximise L, which is achieved by deriving and solving the following first-order conditions:

$$\frac{\partial L}{\partial x}=\gamma Q_f=0 \tag{9}$$

$$\frac{\partial L}{\partial T_f^i}=\gamma Q_f-\lambda^i=0 \qquad i=o,m \tag{10}$$

$$\frac{\partial L}{\partial T_{of}^i}=\gamma w_{of}^i-\lambda^i\geq 0 \tag{11}$$

$$T_{of}^i\geq 0, \quad T_{of}^i\left(\gamma w_{of}^i-\lambda^i\right)=0 \qquad i=o,m$$

$$\frac{\partial L}{\partial T_l^i}=\frac{\partial U}{\partial T_l^i}-\lambda^i=0 \qquad i=o,m \tag{12}$$

$$\frac{\partial L}{\partial c}=\frac{\partial U}{\partial c}-\gamma=0 \tag{13}$$

$$\frac{\partial L}{\partial \lambda^i}=\bar{T}-T_f^i-T_{of}^i-T_l^i=0 \qquad i=o,m \tag{14}$$

A subset of these first order conditions (Equations (10) to (12)) allows us to discern how the farm operator or the other household member would optimally allocate time to leisure only, or to leisure and to work activities including on and/or off the farm (Huffman and Lange, 1989). Both the farm operator and the other household member are assumed to always have positive optimal hours of farm and leisure time i.e. Equations (10) and (12) are equalities. Accordingly, the participation rule adopted by the farm operator or the spouse based on Equation (11) suggests that individual i will decide to participate in off-farm labour market activities when the reservation wage from off-farm work $\left(W_r^i=\frac{\lambda^i}{\gamma}\right)$ and leisure is less than

the offered off-farm wage rate $\left(W_{of}^{i}\right)$. Resolution of these first-order conditions allows for four off-farm work strategies: only the farm operator works, only the other household member works, both work or neither works. The strategies considered here are variants of those utilised by Benjamin *et al.* (1996) and Benjamin and Kimhi (2006), where off-farm work choices of French farm couples were analysed in conjunction with the decision to hire farm labour.

To conclude, the model presented above is the traditional unitary model of household decision making with two members in the household. There is no bargaining between the household members and the decisions reached are efficient by definition and this makes the model tractable even when farm household production is introduced into it. It is this framework which informs the empirical analysis in this thesis.

2.6 Summary

This chapter has reviewed and assessed the currently available literature relating to the neoclassical household models underpinning the study of the allocation of time of household members. Sections 2.2 and 2.3 outlined the main characteristics of the unitary and non-unitary models while Section 2.4 presented the main arguments for the use of the unitary model of household behaviour as the base for the agricultural household model. The main features of the various economic models discussed in this chapter are presented in Table 2-1 (adopted from Chiuri (2000)). Section 2.5 provided an overview of the specification of the theoretical model of the time allocation decisions of farm household members. As outlined in Chapter 1, the main objective of this thesis is the study of the time allocated to various activities instead of the more abstract basic commodities. Even with their limitations, extensions of the Beckerian household production framework represent the most straightforward way to model time allocation within farm households. In the chapters that follow, the unitary model of household behaviour theory specified in Section 2.5 will be used as the theoretical framework to empirically model how farm household members allocate their time.

Table 2-1 A Comparison of the Main Features of the Various Household Labour Supply Models

Reference	Decision Model	Within Household Allocation	Individual Interdependence
Unitary Models			
Samuelson (1965)	Restrictions on income distribution	Income Pooling Hypothesis (IPH)	-
Becker (1974)	Household with an altruist and H-1 egoists	Distribution much in favor of the altruist, IPD	Caring altruism, public goods, externalities, income
Gronau (1977)	Single-person household	Households, leisure and market activities	-
Graham & Green (1984)	Two wage-earner household	Introduces joint production	-
Non-Unitary Models			
Manser & Brown (1980) McElroy & Horney (1981)	Bargaining: Nash solution Dictatorial solution Kalai Smorodinsky	Distribution relevant because of the threat point i.e. the utility level when divorced	Paternalistic altruism, public goods, goods transfers
Lundberg & Pollak (1993)	Bargaining: Nash solution	Distribution relevant because of the threat point i.e. Nash subscription equilibrium for public good	Paternalistic altruism, public goods, goods transfers
Chiappori (1988, 1992) Browning & Chiappori (1998)	Collective model	Allocation depending on exogenous function of income distribution (and an exogenous subscription on public goods)	Egotistic preferences or caring altruism, private (public) goods, income transfers, children, risk sharing
Apps & Rees (1997) Chiappori (1997)	Collective and exchange model	Allocation depending on an exogenous function of income distribution and on the hosuehold production function	Egotistic preferences of caring altruism, private (public) goods, income, goods transfers, household production

Data Source: Adopted from Chiuri (2000)

3. Empirical Studies of Time Use

3.1 General Introduction to Time Use

Daily life is created by individuals performing a multitude of activities in order to fulfil the projects that they are involved in. Each individual is endowed with time, a resource with internationally standardized units of measurement (i.e. hours, minutes and seconds). Thus, the study of time use is "the area of social science that focuses on what we do with our time and why" (Farnworth, 2003). It serves to increase knowledge of these daily activities and is an effective approach to better understand the details of everyday life which are mostly taken for granted e.g. time spent travelling or involved in leisure activities. Time use surveys in general are a specific type of survey tool in which individuals record detailed information about their performed activities over a given period of time, typically a 24 hour day. Providing a window to actual lifestyles, they "reveal the details of an individual's daily life with a combination of specificity and comprehensiveness not achieved in any other social survey" (Gershuny, 1995). More specifically, time use surveys make it possible to objectify the less institutionalised social activities of individuals and their durations, such as household tasks, leisure, voluntary activities and activities whose duration is not directly controlled by an institution.

The time use survey is the only survey technique available at present that provides a complete overview on how individuals spend their time in paid and unpaid activities, on a daily and weekly basis (Hirway, 2000; Chenu and Lesnard, 2006). Generating invaluable information about how people structure their everyday life, the time use methodology can be used to understand the behavioural problems of humans and to guide planning and policy development on issues such as work-life balance, the provision of childcare, caring for the elderly, the knowledge society, equality issues and social capital. For example Harvey *et al.* (2006) used a 24 hour recall diary to study the behaviour of people with schizophrenia living in North London (n=192) while McGuire and Popkin (1990) conduct a comparable review of time use studies to present programme and policy options to address the obstacles to effective participation in programme interventions among women in the third world.

Contingent on design, time use surveys show, at the very least, what activities people do week to week or day to day though the most detailed time use surveys can show what people are doing, where they are, who they are with and how they feel minute by minute. Within this context, Section 3.2 outlines the development of time use as a tool for research and describes the various instruments available for the collection of time use data. This is followed in Section 3.4 by a summary of the various applications of time use surveys. Section 3.5 reports the challenges when attempting to analyse time use data using econometric methods and presents an overview of the econometric models that are frequently used when dealing with time use data. Section 3.6 describes the caveats or limitations of time use studies in measuring and monitoring participation and levels of participation in various activities. Finally, Section 3.7 discusses the reliability and validity of time use estimates.

3.2 Historical Development of Time Use Research

The interest in time use and time budgets in the social sciences can be traced back to the research of nineteenth century French engineer, sociologist and economist Frédéric Le Play on family budgets (Chenu and Lesnard, 2006). However, Zuzanek (1980) noted that the extension of the paradigm to include all human activities in time budgets dates from the late nineteenth century and is owed to the Englishman F. Giddings. The earliest published accounts of the social uses people made of their time appeared in English philanthropist Bevans' (1913) *How Working Men Spend Their Time* and English feminist and socialist Pember-Reeves'(1914) *Round about a Pound a Week*, in which, members of the working class were asked about their associative activities, visits to coffee houses or pubs and religious service attendance.

The bulk of pre–World War II diaries originated in the Soviet Union, Great Britain and the United States, with a number of others in France and Germany. The earliest large-scale systematic time use surveys using the diary method were those of S.G. Strumlin in the Soviet Union between 1922 and 1924. Conducted in the context of the New Economic Policy, these studies were undertaken for use in governmental and communal planning (Szalai, 1972). The study in the UK was aimed at getting new insights into human behaviour and the lifestyles of people, while the U.S. study near the end of the 1920's by the Bureau of Home Economics of

the U.S. Department of Agriculture was intended to increase understanding of the effect of new technology on the time use of farm homemakers (Lundberg *et al.*, 1934). In France, following the foundation of the Institut National de Statistique et d'Études Economiques (INSEE) in 1946, three time use surveys were produced between 1947 and 1958 (Stoetzel, 1948; Girard, 1958; Girard and Bastide, 1958). These focused on variations in occupational and domestic workloads among married woman by the number of children they had. The first survey used a combination of daily diaries divided into five-minute segments and weekly ones in half-hour segments (Cushman *et al.*, 2005a).

In the early 1960s, a major attempt at establishing international standards and allowing an international comparison of different uses of time in market and planned economies was headed by the Hungarian sociologist Alexander Szalai (1972). He put his organisational talents to work for the *Multinational Comparative Time-Budget Research Project*, which he directed from the European Coordination Centre for Research and Documentation in the Social Sciences, headquartered in Vienna. The study arose from ideas generated in a conference on 'The Use of Quantitative Political, Social and Cultural Data in Cross-National Comparisons' at Yale in 1963 (Rokkan, 1966). Szalai's project collected data in thirteen countries in Europe, North America and South America and still stands as a landmark in cross-national survey research. It is, according to Harvey and Pentland (1999), unquestionably the most significant time-diary undertaking. Szalai drew countries from the East and West to participate in the 1965 and 1966 surveys as he sought to reduce the East-West split and believed international time use comparison as a theme was likely to interest academic institutions on both sides of the divide and ultimately create a path towards unison. The countries chosen were urbanised and the surveys were mainly focused on inhabitants of medium sized cities. The thirteen countries involved in the project were Cuba, Bulgaria, Czechoslovakia, the German Democratic Republic, Hungry, Poland, the U.S.S.R. and Yugoslavia in the East; Belgium, France, the Federal Republic of Germany, Peru and the USA in the West. Unfortunately the data for one of the countries, Cuba, was never analysed and therefore is not usually included in publications which refer to the study. The surveys were by means of daily activity diaries and the coding was on the basis of 99 activities. It resulted in a major publication, *The Use of Time* (Szalai, 1972), that has had a profound and lasting effect on the major methodological characteristics of the time use diary and collection

of time use data and has acceded to the status of 'time use bible' (Harvey and Pentland, 1999; Chenu and Lesnard, 2006; Mrkic, 2009).

The application of time use surveys has flourished and changed considerably in the decades since the 1960s. In the mid-1980s, Jonathan Gershuny indicated that the expense and the esoteric nature of time use research meant that never again would there be a research opportunity like that afforded by Alexander Szalai in the 1960's. Now though, so many countries of the developed world are collecting new time diary data (many of them to a standardised design), time use research is increasingly being recognised as an important method of data collection. National time use studies have been conducted in virtually all Eastern and Western European countries. In the last twenty years, a number of developed countries including Japan, The Netherlands, Canada, Korea, Finland and Norway have been conducting household time use surveys with increasing frequency. Part of the reason why there has been an increase in the last decade or so in time use data collection in some developed countries is that women, and the national government agencies representing women, have campaigned for governments to provide the statistical organisations with additional resources to conduct such surveys (Ironmonger, 1999). Still, in some countries such as Ireland for example, the collecting and coding of activity diary responses continues to be an extremely expensive operation. For this reason, until 2005, Ireland was one of the few countries in the developed world not to have collected time use data. However in 2005, in an attempt to address an important gap in comparative research, a nationally representative survey (n=1,089) using a time use diary methodology was undertaken (McGinnity *et al.*, 2005).

The research network that developed around Alexander Szalai and the 'Multinational Project' led to the founding of the *International Association for Time Use Research* (IATUR) at the 1970 meeting of the International Sociological Association. In the 1980s, one of the IATUR's most active figures, Briton Jonathan Gershuny, launched the Multinational Time Use Study (MTUS) with the purpose of developing a single file that would stack harmonised data on time surveys composed of identically recoded variables observed in 24 countries over 30 years. The original MTUS dataset allowed comparison of British time use data with the 1965 Szalai Multinational Time Budget Study and data from Canada and Denmark. The MTUS has since grown to encompass over 60 datasets from 30 countries and now incorporates data from

the Harmonised European Time Use Survey (HETUS), American Time Use Survey (ATUS), and other national level time use projects. Professor Gershuny and Dr Kimberly Fisher currently manage the study in collaboration with other time use scholars at the Centre for Time Use Research (CTUR) in the Department of Sociology at the University of Oxford.

In the early 1990s, the Statistical Office of the European Commission (Eurostat) noted that although time use surveys based on a comparable survey design had been conducted in most European countries, the international comparability was low due to national variations in the survey designs. The project for HETUS originated from a discussion of the potential uses of time use surveys at the international conference of the Eurostat Working Party on Social Indicators in 1992 (Eurostat, 2000). Spearheaded by a group of experts from EU and European Free Trade Association (EFTA) countries, the project set out to formulate a series of recommendations that would work to increase the homogeneity of national surveys conducted in the EU (Chenu and Lesnard, 2006). Workshops were arranged where the comments, knowledge and expertise of international organisations (ILO, OECD, FAO, UN/INSTRAW and UN/Statistical Office) as well as the skills and experience of IATUR members' were taken into account. The project approved work toward the development and piloting of a European time use survey based on the detailed analysis of national Time Use Surveys carried out in EU and EFTA countries. In 1996 and 1997, 18 countries from the EU and Central Eastern Europe participated in a pilot time use study undertaken under the auspices of Eurostat. Following this, in September 2000, Eurostat (2000; 2008) published a set of guidelines (updated in 2008) for collecting time use studies: 'Guidelines on Harmonised European Time Use Survey'. The guidelines, which potentially provide research opportunities similar to those by the MTUS, provide a solid methodological basis for countries and independent researchers intending to carry out time use surveys. These set of directives aim to ensure the results of each country's time use surveys are comparable, greatly increasing the value of the data (Eurostat, 2000).

3.3 Methodologies for Collecting Time Use Data

While a single focus upon 'a day in the life' might seem straightforward in principal, as with many other survey designs, there are a number of different approaches that may be followed

when collecting activity and time use data. These range from direct observation, activity frequency and duration surveys to retrospective recall. Time use diaries and interviews reconstructing the same or the previous day's activities lie between these extremes, and validation studies have shown time use diaries to be superior to less expensive substitutes (Robinson, 1985a; 1985b; Juster, 1986). The following sections describe some of the various instruments and methods available for the collection of time use data.

3.3.1 Self-Reporting Time Use Diary

The dominant instrument of time use data collection is the time use diary, "a log or diary of the sequence and duration of activities engaged in by an individual over a specified period – most typically a 24-hour day" (Converse, 1968). It acts as a sort of social microscope that allows one to examine facets of an individual's daily life that are not otherwise observable (Harvey and Pentland, 1999). The essence of the time diary method is that respondents are typically asked to make a complete chronological record of their activities for a designated weekday or weekend day covering a 24-hour span. Usually it is possible to record not only the primary activity but also a secondary activity, while a broad range of subjective and contextual data[12] can be collected at the same time (where, who with, perceived satisfaction, control, stress, etc.). The time framework for time use diaries can vary from one 24-hour day to a week, which considerably reduces the amount of attention given to less institutionalised activities. The most widely used is the intermediary diary where the inquiry bears on two days, one weekday and one weekend day. In self-reporting diary studies, people provide frequent reports on the events and experiences of their daily lives in a time diary designed for the purpose of the study. Time use diaries can ask open-ended questions about the respondent's amount of time spent in activities, whereby respondents enter the time an activity starts and finishes and note the activities in terms they choose themselves. The wording or designations are later coded in accordance with an activity nomenclature. Alternatively, time diaries can take the form whereby a pre-determined list of activities is

[12] The contextual dimension refers to the physical, psychological, social and temporal features of the environment in which a specific activity is taking place and provides meaning to activities and groups of activities.

provided and respondents are required to choose an activity from this list for each unit, 'episode' or 'grain' of time of (say) 15 minutes in the 24-hour period.

One of the advantages that time use diaries have over conventional questionnaires is that they are less susceptible to the failure of recall because individuals are usually required to fill in the diary at various stages throughout the day and, more importantly, to normative biases in reporting behaviour (Robinson, 1985b). Conventional questionnaires usually focus on one activity of interest, however with the diary, respondents have no cues about activities the researcher may be interested in and therefore cannot project a favourable image of themselves with respect to any one activity. Time diaries also provide reliable information about activities that respondents do not necessarily have about themselves because respondents do not generally calculate the aggregate amount of time they devote to various activities, or if they do, their estimates are likely to be inaccurate. Another advantage of data from time use diaries is that very complex information is provided in a very flexible way. Each moment or grain of time during the day is mutually exclusive and in focus, as only one main activity is assigned to each grain of time. All 1,440 minutes of the day are equally distributed across the day allowing certain 'trade-offs' between activities to be examined.

The main disadvantage of the diary method is that not all weekdays are recorded for every respondent in most time use surveys. A weighting procedure, such as that used by Bonke (2005), calculating 'synthetic' weeks can be applied in order to take into consideration the weekly variations. Notwithstanding the disadvantages, there is widespread agreement that time diaries, capturing the flow of daily activity, are the theoretically optimal approach for capturing activity data (Lingsom, 1979; Harvey and Royal, 2000).

3.3.2 Activity Frequency and Duration Surveys

Activity frequency or duration surveys provide an alternative measurement approach to the time use diary method. They are often stylised lists of activities for which respondents provide frequency and duration of participation information of which labour force surveys, shopping studies, travel studies, readership surveys and studies of general leisure time use, and particular facets of it such as television viewing habits, are examples. In these studies,

respondents are generally given a pre-set list of activities and are required to state how much time they 'normally' or 'typically' devote to each activity during a reference period such as a day, week, month or year. Using this approach, some survey designers attempt to cover all possible activities, while others ask only about activities of particular interest to their research e.g. television watching.

The U.N.S.D. (2005) identified that surveys containing such stylised questions tend to have a high degree of error. This can occur because of the basic problem of perception in a respondent's ability to provide accurate information. In order to be accurate and consistently interpreted by all subjects, the activities must be very narrowly defined and therefore sharply focused. Asking someone "How many hours do you work?" or "How many hours do you spend doing housework?" assumes that each respondent interprets work or housework the same way and is able to comfortably add up the total amount of time they spent on these activities over last day or week. This results in long lists of activities and there is a danger of poor subject compliance due to the resulting tediousness (Harvey, 1999). Another cause of low data validity and reliability with this particular survey design is that respondents are essentially asked to aggregate details of their time. It can be very difficult if not impossible for respondents to recall to the last minute how much time they spent on a certain activity, particularly if the activity concerned occurs in intermittent spurts, so answers will always contain an element of guesswork. Because of this, time spent on some activities may be overestimated while the time spent on others may be underestimated. Under and overestimation can also occur because respondents tend to over-report time spent on activities that are considered socially desirable and underreport activities that they consider to be less desirable. For example, educated parents tend to overestimate the time they spend reading to children when stylized questions are used, because the activity is viewed as socially desirable (Hofferth, 2000).

The literature suggests that diary based estimates of time use are more reliable and accurate than estimates derived from direct questions (Robinson, 1985b; Stafford and Duncan, 1985; Robinson and Bostrom, 1994; Robinson and Godbey, 1997; Juster *et al.*, 2003). Comparing data from stylized estimates of time spent on home repairs and alterations 'during the past 12 months' and four time diaries covering the same 12-month period, Hill (1985) finds that individuals underreported their activity participation by up to 50 percent in the stylized

questionnaire (n=384). Robinson and Godbey (1997) found that Americans were overestimating the time they spend on paid work by 10 percent following a comparison of the results from the U.S. Bureau of Labor Statistics and the results from time use diaries. They argue that the methodologies used by many countries to estimate productivity and labour force participation could be extremely inaccurate. Comparing questionnaire estimates from the U.S. National Survey of Families and Households, 1992-1994, and diary-based estimates from a time diary sample in 1995, Bianchi *et al.* (2000) found that the questionnaire based estimates of housework time produced figures 50 percent higher than the diary data. These results are consistent with those of Juster *et al.* (2003). Bonke (2005) suggests that the stylised approach should be able to show 'major differentials at least at the aggregate level' between the activity patterns of different groups, although diary methods would be more reliable.

3.3.3 Activity Logs

Activity logs require the respondent to record all occurrences of a particular activity during some specified period, which can range from one day to several weeks. For example, a food preparation log would contain start and finish times for all episodes of food preparation during the reference period. It may also include some or all of the following: the purpose for which the food was being prepared, the number of people about to be fed, what was being prepared, the main ingredients, the value of the ingredients, the cooking method or the appliances. Activity log information is more detailed than that from activity frequency or duration surveys, as activities are recorded in sequence, providing information in each episode of activity rather than just a total for the period. Other information can also be recorded (e.g. for whom the activity was done), bringing a social context to the data and permitting more analysis than just information on time allocation.

Activity logs, however, focus on one particular type of activity only. They are frequently used in media, travel and shopping studies, for instance, and can be useful in data collection on rarely occurring activities. For rare activities, logs can be administered each time the activity occurs over a period such as several weeks, while they can also be used in

conjunction with other time use data gathering methods, such as diaries, to gather information on more frequently occurring activities.

3.3.4 Recall Self-Reporting (Retrospective/Recall Diaries)

Recall self-reporting includes research methods (e.g. recall diaries) where respondents report retrospectively on their time use, usually to an interviewer. A recall diary is actually a long open-ended question initiated by the interviewer asking "What were you doing at one minute past midnight on (diary day)?". The response is written out verbatim on the diary form and except for personal care activities – e.g. sleep – is followed by supplementary questions such as "Where were you?", "Who were you with?", "Were you doing anything else at the same time?" and, if not obvious, "How (mode of transport) did you get from _____ to _____?". Time blocks are open-ended (as opposed to, say, 15 minute intervals) and interviewers continually probe to ensure consistency of ending and beginning times, location, etc.

Like other retrospective reports, 24-hour recall requires the respondents to (a) select the correct time interval, (b) recall the relevant events, and (c) aggregate the retrieved information into the appropriate format. Such retrospection is often plagued by biases. Participants' limited ability to recall often results in retrospective 'aggregate' responses that reflect faulty reconstruction of the activity of interest. For example, Engle and Lumpkin (1992) find that, even with cognitive enhancement, college students only accurately reported 66% of the activities that observers saw them perform during a two-hour period on the previous day. Although the accuracy of recall can be enhanced by minimising selection, memory and aggregation requirements, the relative efficiency of assessment may still entail an increased risk of cognitive and motivational factors that compromise the validity of the answers. Thus, 24-hour recall should not be considered a completely accurate record of time use. Research in laboratory and in natural settings has shown that, even with short time lags between the event and its recording, the reliability of retrospective self-reports depends on the properties of the acts, on base rates, desirability, gender and other factors (Gosling *et al.*, 1998; Fahrenberg *et al.*, 1999). For example, findings by Press and Tonsley (1998) confirm that the reporting gap found in housework surveys is influenced not only by memory problems, but also by social desirability, in particular by social expectations about gender

roles. Comparing retrospective self-reported data of time use (n=4,939) with self-monitoring data (n=13,017), they find that both husbands and wives over-reported their contribution to housework in retrospective reports by 149% and 68% respectively.

Response error due to consideration of social desirability is also an issue with self-reporting questionnaires as respondents often control the image they project of themselves to the interviewer through their answers. Because an interview or survey is a form of social interaction, when asked to recall leisure or cultural activities, for example, respondents are often succumbing to the normative expectations of society and over-report participation in more desirable, socially approved or prestigious activities in order to give a favourable impression of themselves (Phillips, 1971; Sudman and Bradburn, 1974). The very design of time use diaries, with their focus on the reconstruction of the sequence of daily events, takes the normative pressure off the respondent's shoulders.

3.3.5 Experience Sampling Method

Developed by Larson and Csikszentmihalyi (1983), the experience sampling method (ESM) makes use of a spot sampling strategy while avoiding the problems associated with an intrusive observer. It requires the respondent to carry an electronic watch or small beeper and record their exact activity, along with other sets of information of interest to the researcher, when the beeper goes off at random points during the day (assigned by the researcher). This approach decreases the potential for memory bias associated with retrospective reporting (Bolger *et al.*, 2003). A typical ESM response sheet asks very detailed questions about the experiences at the specific moment that would be difficult to recall at later times, for example, "how well were you concentrating?" (Csikszentmihalyi and Selega Csikszentmihalyi, 1988). Most recently, handheld electronic devices (e.g. personal digital assistants or PDAs) have been advocated as the preferred data collection instrument (Hektner *et al.*, 2007; Carson *et al.*, 2010). Methodologically, ESM affords researchers the flexibility to obtain empirical data on the following aspects: frequency and patterning of daily activity, social interaction and changes in location; frequency, intensity and patterning of psychological states, i.e. emotional, cognitive and conative dimensions of experience; and frequency and patterning of thoughts, including quality and intensity of thought disturbance. Respondent burden is comparatively

small as the majority of beeper studies involve seven to ten signals per day for seven days. However, non-response can be an issue due to equipment malfunction, forgotten beepers or the nature of the location of the activity at the time of the beep. Nonetheless, reliability and validity checks on beeper data have presented favourable results and in comparison to some other data collection methods, beeper studies have been shown to pick up more 'idle time' (Csikszentmihalyi and Larson, 1987), something that is quite likely to be forgotten if data collection is dependent on recall.

A methodology that lends itself well to smaller scale studies, the uses of ESM are not restrictive to research questions on time use. Robinson (1985b) uses ESM as a validation test for activities reported in diaries, while Farnworth (1998a; 1998b) used ESM and interviewing to investigate the time use and subjective experience of young criminal offenders on probation (n=36). A study by Larson *et al.* (2001) provides a description of the allocation of time of urban African American adolescents in Chicago (n=253). Participants in the study carried alarm watches for one week and completed self-report forms on their immediate activity, situation, and subjective state when signalled by the watches at random times. Fitzgerald-DeJean *et al.* (2012) used a time-based, fixed-schedule sampling application of ESM to attain self-reports throughout an aphasia (impairment of language ability) treatment programme. While handheld devices (e.g. PDAs) are less bulky, more mobile and serve well as a programming and storage device when compared to a pager/wristwatch/paper technology, they are considerably more expensive. As a result, the ESM was deemed inappropriate as a methodological tool for the research in this thesis.

3.3.6 Direct Observation Studies

Direct observation studies, such as those undertaken by anthropologists in third world countries (McSweeney, 1979; McSweeney and Freedman, 1980), are those in which observers rather than respondents keep time records of what people do either continuously or on a random spot basis. This approach is frequently used to capture more precise and detailed information in restricted settings (such as hospitals or classrooms) or situations when self-reporting is likely to produce highly questionable results (for example, when respondents do not have a clear sense of time). The classic study of this type is Barker and Wright's (1951)

observation of One Boy's Day, which catalogued more than 500 separate activities during that day. In the field of health care, Tabenkin *et al.* (2004) used direct observation techniques to examine differences in time use and preventive service delivery during outpatient doctor-patient encounters (n=3,384), while Vannest and Hagan-Burke (2010) employ direct observation to study the time use of teachers in special education (n=36). Another interesting use of direct observations has been in the field of road safety. Using direct observations surveys, Eby *et al.* (2002) assessed the effects of standard enforcement legislation on safety belt use in Michigan. More recently, technological advancements have facilitated unobtrusive continuous observation through geographical tracking and recording, photographic and video analysis (Hudson *et al.*, 2003; Hodges *et al.*, 2006). GPS/GSM continuous real time geographical tracking may be paired with real time physiological monitoring and recording, which allows the direct estimation of the metabolic consequences of various activities (Gershuny, 2012).

Considered the gold standard when it comes to validity and reliability for time use data collection (McSweeney and Freedman, 1980; Hames, 2010), direct observation as a methodology also comes with a set of limitations. Firstly, direct observation is extremely costly since it requires stationing an observer within the household for an extended period of time. Secondly, direct observation is bound to involve a high refusal rate and the refusals may not be random. Finally, and possibly most importantly, is the potential for a 'Hawthorne effect' (Masuda *et al.*, 2012). This is where the observation of a set of activities alters the nature of the activities, since an observer would obviously be an intruder into the respondent's privacy, prompting the respondent to project a socially desirable image of them self. They may do this by directing attention to activities that would otherwise not be conducted in the presence of an observer (Floro, 1995; Floro and Miles, 2001). For the reasons outlined, direct observation was discounted as a method of data collection for this research.

3.3.7 Other Approaches

There are several alternative, although less frequently used, methods of collecting time use data. These include: the electronic tracker system; on site verification; telephone coincidental

studies; various high tech approaches; and the most recently developed pictorial method. The use of electronic trackers is a method utilised by parole officers to verify whether those out on parole stay within certain boundaries. More recently, media rating services have developed electronic badges that TV and radio audience members wear. These record when the respondent is in receiving range of an operating television or radio. In the case of on-site verification, an observer counts the number of people at a particular site (e.g. a church, youth club, school) at a particular time and uses this information to project that to the larger population under study (Chapin, 1974; Hadaway *et al.*, 1993).

Telephone coincidental studies require respondents to report what they are doing at various intervals during the day when the phone rings. Such studies need to employ careful procedures to appropriately weight the households in which no one was home when the telephone rang, or what the other people in the household were doing when it rang; otherwise, one can generalise only to the population that is both at home and willing to pick up the phone, biasing the results of such a study. As phone interviewing costs have increased substantially, response rates and sample quality have declined, leading to the development of a new type of coincidental study, the online coincidental study. Instead of respondents recording their activities when the telephone rings, they record their activities when a pop up appears on their personal computer or smartphone. For example, the GfK Group (2012) used online coincidental surveys to measure all viewing of TV programs and movies during a two-hour period (n=13,873). In some cases, they supplemented these surveys with smartphone surveys collecting attitudinal information and photos taken by the respondents (n=298).

Not yet fully developed and established but fully on the research agenda are new high-tech approaches combining passive measurement of geographical position (using GPS and accelerometer data) and bodily states (using tiny monitors for heart rate, blood lipids, etc.) (Harms and Gershuny, 2009). These approaches include active questioning about the nature and purpose of the activity employing several recording options: via personal communication or recording devices carried by the respondent/subject; nearly concurrent with the activities (What were you doing when the beeper sounded?); or perhaps later the same day via the internet.

One further method of time use data collection is the pictorial method developed by researchers confronted by the difficulties associated with collecting data from illiterate populations who are unfamiliar with traditional 'clock' time. Masuda *et al.* (2012) developed two pictorial methods to collect time use data from such populations. The first method, modelled on the recall interview method, asks respondents to place a piece of pasta on pictures of activity categories in proportion to the amount of time spent on that activity during the previous day e.g. one piece of pasta represented twenty minutes. The second uses a timer and sequentially numbered stickers to re-create the temporal order of activities in 30 minute increments. Each time the timer beeped, the respondent was instructed to place the next numbered sticker on the picture that best represented the primary activity they had been engaged in for the previous 30 minutes.

3.3.8 Summary of Methodologies

Each of the methods of time use data collection outlined has distinct advantages and disadvantages with respect to relative reliability, response rates, cost of data collection, etc. Some elicit high respondent co-operation (e.g. time use dairies and activity frequency surveys), while others are burdensome and less likely to produce a good response (e.g. direct observation studies and studies utilising the experience sampling method). Some are very expensive to administer (e.g. direct observation and telephone coincidental studies), while others are comparatively cheap (e.g. self-reporting time use diaries and activity frequency surveys). Some produce data of low reliability (e.g. activity frequency surveys and recall diaries), while others have higher accuracy levels (e.g. time use diaries and direct observation studies). Chenu and Lesnard (2006) indicate that for activities whose duration is institutionally controlled – paid work, teaching – there is strong convergence between the respondent self-assessment i.e. activity logs and the activity diary method of reporting times spent on activities. This means that for any investigation centred primarily on institutionalised activities (namely workforce surveys), researchers can justifiably settle for using the self-assessment method. But if a research project is interested in relatively un-institutionalised activities, as is this study, the material collected through self-assessment is marred by considerable cognitive and normative bias. A number of studies, including those by Robinson (1985b), Juster and Stafford (1991), Robinson and Godbey (1997), Gershuny

(2000), Bonke (2005), and Hirway and Charmes (2007), consider the diary method the most accurate and effective tool for obtaining data on time allocation, since it is more detailed and is associated with less error than respondent-provided estimates.

Overall, it is not possible to state unambiguously that one method is superior to another as which method is the best depends ultimately on the purposes for which it will be used. To date, however, the time diary approach has proved the preference of most researchers as it enhances analysis by providing a more comprehensive means of collecting time use data in contrast to the other methods outlined, mainly due to the multiple dimensions of the data i.e. contextual information and simultaneous activities. The strengths and weaknesses of each of the methods imply that a hybrid strategy can sometimes be effective. For example, a study can be based primarily on time diaries but include stylized time use questions for activities that individuals participate in only occasionally such as volunteering, attending sporting events or visiting others. Thus, for the purpose of this thesis, the time use diary method with accompanying individual and household questionnaires was deemed the most appropriate method of time use data collection.

3.4 Time Use Literature: Applications or 'Fields of Utilisation' of Time Use Data

3.4.1 Introduction

It is hard to envisage any avenue of human endeavour that is immune to some dimension of temporality. How long? When? Before or after? How often? At least one of these questions is likely to be relevant to any given enterprise, issue or policy (United Nations and International Research and Training Institute for the Advancement of Women, 1995; Harvey and Pentland, 1999). Consequently, time use datasets have an unusually broad range of possible applications across a virtually unlimited array of concerns and new applications are constantly emerging.

Many academics, Andorka (1987), Hirway (2007b), Hirway and Jeyalakshmi (2007), Ironmonger (2007), have examined the motivations and uses of time use studies, ranging

from practical applications to the examination of complex theoretical problems, and have identified a variety of diverse potential 'fields of utilisation'. Two broad categories have been identified for the potential application of time use studies (Andorka, 1987). The first relates to consumption, for example, the examination of the extent of mass media contact, the determination of the demand for cultural and other leisure goods and services and the study of consumer behaviour. The second relates to the examination of the gender division of labour, the assessment of the informal economy and the study of household economics including the needs of the elderly and the care of children. Time use data is also used to compile satellite accounts, assess well-being and the quality of life, study the impact of loneliness on the elderly, explore issues relating to the lifestyle of individuals, plan urban areas, establish social indicators, and build better models of economic and social systems than is possible with existing data. At the macro level, time use data has been used to calculate a more comprehensive picture of national productivity and wealth. Thus, time use data can inform social and economic policy debates on issues such as work-life balance, the provision of childcare, caring for the elderly, the knowledge society, equality issues, social capital, and many more important public policy issues.

The applications of time use research discussed in the following sections demonstrate some of the ways that data from national time use datasets or custom designed time use surveys can be used to research a range of different topics, or to assist in planning and development. Experience in numerous countries has shown that, when it is available, time use data is open to numerous and sometimes unexpected uses. Once users understand the richness and versatility of such datasets, the applications expand. A few of these applications, the extended GNP calculations and the measures of the domestic division of labour for example, are well developed and widely used in Europe. Despite the long history of time use data collection, and perhaps because of the complex data processing requirements of diary datasets (now much better understood and more manageable in modern statistical packages e.g. SPSS, STATA and SAS), most of the potential applications exist mainly in the minds of university researchers, statisticians in statistical bureaux and statistical journals (Harms and Gershuny, 2009).

3.4.2 Economic Accounting

A primary public policy use of time use data is to enhance the coverage of national accounts, the principal means of measuring growth in a nation's economy over time. National accounts are important for understanding the impact of government policies, such as subsidised childcare, on the market (monetary) economy and the non-market (household) economy. A longstanding criticism of traditional national economic accounting methods is that they almost exclusively measure market production while failing to include non-market production activities such as those that take place in the home (Fahey, 1992; Goldschmidt-Clermont and Pagnossin-Aligisakis, 1999; Gershuny, 2000; Landefeld and McCulla, 2000; Krueger *et al.*, 2009). Domestic activity, child care, time allocated to shopping and services, education as a student and many more activities are all fundamental to the provision of goods and services and therefore classified as productive work. However, paid work is the only productive work that is included in the national accounts. This serious underestimation of wealth or productivity is particularly true in developing countries, where subsistence agriculture and related activities which are not recorded are a main source of economic support for large sections of the population. Inaccurate economic accounting can underestimate total economic output by understating the economic value of women's work in the home. On the other hand, it can overestimate economic growth by failing to take into account the output that is lost when people switch their activities from the household (painting one's living room or doing one's gardening) to the market sector (hiring a painter or gardener) or vice versa. Failure to fully understand both the size and structure of an economy's total productive activity leads to the conception and implementation of, at best, many useless policies, and at worst, harmful policies (Berio, 1986).

It is obvious from this perspective that the inclusion of non-market activities in national economic accounts would yield a complete perspective and understanding of the role of households in the total economy and of total production in an economy. Because time use studies cover all kinds of activities, they allow for the development of satellite accounts that estimate the economic value of domestic and not-for-profit activities, thereby permitting the adjustment of national account figures accordingly (Harvey and MacDonald, 1976). For example, Goldschmidt-Clermont and Pagnossin-Aligisakis (1999) present the monetary valuations of unpaid household labour and of households' non-market product achieved on

the basis of time use data from a number of developed countries. Similarly, Landefeld and McCulla (2000) use point estimates of time use activity, from the U.S. Bureau of Economic Analysis data 1946 to 1997, to estimate the value of household non-market services incorporating non-market household production into the national accounts framework. Significant efforts to include non-renumerated work into national accounts are under way in a number of developing and developed countries, including Australia, Canada, the Netherlands, the United Kingdom, France and Norway (Ironmonger, 1997). It is important to remember though that time use does not measure individual effort i.e. it does not distinguish between one hour of work in harsh circumstances and one hour worked in more comfortable circumstances: time spent working in the elements on a construction site or time spent by an engineer working in a warm office are very different from the human point of view.

3.4.3 Labour Force Analysis

There are a number of different applications of time use data when it comes to monitoring paid work. It can be used to examine the issue of work-life balance i.e. the period of time spent on paid work versus leisure. An analysis of time use data can also provide useful information on how much paid work is taken home by employees and the impact that working different shifts has on time spent with families. Perhaps one of the most interesting applications of national diary data in recent years has been the comparative studies of the hours of paid work recorded in diaries to the traditional labour hours estimates regularly collected by government departments. There is a general consensus among researchers that the direct recording of work activities in time use surveys more accurately reflects the reality of hours contributed to paid work than typical labour force survey data collected by means of a questionnaire (Niemi, 1983; Juster and Stafford, 1991; Robinson and Gershuny, 1994; Robinson and Godbey, 1997; Bonke, 2005). Such studies have resulted in the disclosure of the failure of conventional labour supply statistics based on questionnaire information, to capture the extent, range and complexity of the activities which they purport to measure. Disparity in the two kinds of data can be attributed to the influence of attitudes and norms or because respondents tend to report their contracted number of hours disregarding or forgetting any non-work episodes or any irregular overtime in labour force surveys. Measurement error of this kind is excluded in the diary as meals, coffee breaks and other

work breaks, over-time and time on secondary jobs are carefully recorded. For example, Bonke (2005) used data from the Danish Time Use Survey 2001 to compare time use information on hours worked from diaries with similar information from questionnaires from the same respondents. He concluded that Labour Force Surveys are less accurate than studies based on diary information (n=2,741).

Accurate time use data on hours at work can also be used for many basic economic calculations. For example, it enables firms to direct their commercial activities on a more firm empirical basis by allowing analysis of whether changes in productivity can be attributed to changed production of outputs or to a change in the time required to produce those outputs. It also allows analysts to gauge whether workers remain as productive as previously and whether workers in one industry are working longer or shorter hours than workers in other industries. Mata Greenwood (2000) noted that "the number of hours that people work have an impact on their health and well-being (and of those close to them) as well as on productivity levels and labour costs of establishments".

3.4.4 Intra-Household Division of Time/Gender Division of Labour

The study of the division of labour within the household and gender division of labour are closely linked. The study of intra-household time allocation relates to the analysis of the division of resources within a household, time being a resource. From a policy standpoint, knowing the determinants of time allocated to various activities e.g. market work, housework and childcare, helps policy-makers to understand how economic incentives affect intra-household time use. Generally, these economic incentives have gender differential impacts on time use, particularly time use dedicated to either paid or unpaid labour. There exists an extensive literature on the intra-household allocation of time in developed and developing countries (Gronau, 1973; Ilahi, 2000; Fafchamps and Quisumbing, 2003; Daunfeldt and Hellstrom, 2007). For example, Ilahi (2001) analyses the determinants of intra-household time use in Peru in 1994 and 1997 from the perspective of gender analysis (n=2,095) and Khandker (1988) examines the determinants of the economic roles of rural women in Bangladesh (n=500).

The gender division of labour refers to the allocation of different jobs or types of work to men and women, usually by tradition and custom (Alexander and Baden, 2000). This distribution of paid and unpaid work between men and women has been at the forefront of political agendas of most developed countries in recent decades. Bevans (1913); Layte (1999); Ilahi (2001); Apps (2002); Thorsen (2002); Jacobs and Gerson (2004); Anatonopolos and Fontana (2007); and McGinnity and Russell (2008) for example, have all addressed both general and specific concerns of the gender division of paid and unpaid labour with time use data. The nature and extent of intra-household inequality and the impact of that inequality has been analysed using time use data. For example, Bianchi *et al.* (2000) use time-diary data to examine whether changes in time spent in housework from the mid-twentieth century continued into the 1990s and whether the gender gap in women's and men's time in unpaid labour narrowed. More recently, Berik and Kongar (2012) produced a gender aware account of the effect of the recession, precipitated by the 2007 crisis, on the paid and unpaid work hours, leisure and personal care activities of men and women in the US (n=25,430).

Having detailed information about the way time is allocated among the various members of a household, government organisations are better informed on which household members will be most directly affected by policy modifications (U.N.S.D., 2005). In general terms, the issue of mismeasurement of economic activity is particularly relevant to women, since women's activities overwhelmingly dominate the non-market and informal sector in both the more developed and developing countries (United Nations and International Research and Training Institute for the Advancement of Women, 1995).

3.4.5 Measuring the Quality of Life

Issues relating to quality of life are receiving increased attention from researchers and policy-makers world-wide. This growing interest has led to a search for more valid, reliable, cost-effective and high-calibre measures of social and economic indicators of quality of life than those regularly used i.e. income and consumption (UNDP, 1995; Smeeding, 1997; Archya, 1999; Fisher, 2003). Traditional surveys usually include questions relating to income, the frequency with which people see their friends and their participation in various social events. The answers to these questions provide a broad indication of social engagement, though not a

particularly accurate indicator of quality of life. Time use surveys represent a significant step forward from that of traditional surveys focusing on quality of life as they collect more detailed information on peoples' daily activities including the collection of contextual information. Putnam (2000) reported that social contact plays an important role in the concept of quality of life. Thus, detailed information on how individuals spend their time coupled with accurate information on how much social contact they have has led to growing recognition that time use data is important in informing public policy relating to the well-being of individuals (UNDP, 1995; Smeeding, 1997).

Fundamental towards understanding the varying levels of quality of life, and thus constructing superior social indicators, time use surveys furnish the researcher with information on how harried people feel, how compressed both time for oneself and free time are in people's lives and how much of their day is taken up by market and non-market work. This is done by collecting information on actual hours worked, time spent at the workplace, time in unpaid work activities, time in personal care, time in various types of free time engagements and time spent on overlapping activities. Hours of work are related to quality of life to the extent that the greater proportion of the day that is devoted to work, the less time remains for the enjoyment of the fruits of that labour. Unpaid work is crucial for ensuring a certain level of standard of living as it is a major contributor to household and family functioning, providing essential services to people inside the household that would otherwise have to be paid for. Furthermore, time use based surveys such as time use diaries also provide contextual information on the organisation of daily life, including how long people are alone and the varying degrees of combination and concurrence among activities i.e. the level of intrusion of work into other activities and the extent to which people overlap activities. Such detailed information affords the construction of conventional quality of life indicators.

There are a number of studies which use time use data to examine specific aspects of quality of life in different countries – see Harvey and Gronmo (1986), Floro (1995), Gershuny and Halpin (1996), Sullivan (1996), Camporese *et al.* (1998), McGinnity *et al.* (2005), Russell *et al.* (2007), and Spinney *et al.* (2009). Using time use data qualified by indications of 'with whom' each activity was done, Harvey and Gronmo (1986) compared social contact in Canada and Norway. Camporese *et al.* (1998) use data from the 1989 Italian time use survey to show how different roles in households, corresponding to different ways of organising

daily life, in turn correspond to different levels of satisfaction with life on the part of women. Using Australian time use survey data spanning a fifteen year period, Bittman (2004) points to a growth in the proportion of people feeling rushed and stressed. He associates this growth in time-pressure with mental and physical health problems and subsequently deteriorating quality of life. McGinnity and Russell (2007) use data from the 2005 Time Use in Ireland Survey to consider whether employment growth in Ireland leads to high workloads, time-pressure and a lack of free time. Finally, Spinney *et al.* (2009) use time diary data to examine well-being and quality of life but in their case they examine the impact of transport mobility on the quality of life of non-working elderly Canadians (n=10,749).

3.4.6 Free-Time Activities

Free time activities are activities that are undertaken during the time free from, or not spent, on production and maintenance activities. How much free time people in society have can vary by gender, age and social class, among other factors. Respondents seem to have particular difficulties in time accounting when asked to estimate how much free time they have, hence time use surveys have a particular advantage in this area of research (Robinson, 1999b). For example, when American and Japanese respondents were asked to estimate their weekly free time, their estimates were less than half that reported in diaries, representing an underestimation in free time activities of more than 100% (Harris and Associates, 1987; Robinson and Godbey, 1997). It is clear that the extra time required of respondents to complete diaries rather than provide time estimates pays off in more consistent and reliable figures. Several of the free time activities which are regularly recorded in time diaries are outlined below.

3.4.6.1 Social – Leisure and Recreation

The measurement and analysis of leisure has long been a fertile area of study addressed by time use research (Lundberg *et al.*, 1969; Ferge, 1972; Young *et al.*, 1973; Zuzanek, 1980; Shaw, 1986; Harvey, 1990; Robinson and Godbey, 1997; Bittman and Wajcman, 2000). The juxtaposition of leisure, work and personal time in time use surveys enables researchers to look at leisure in the context of the other activities in peoples' daily lives. For example, time

use survey data has been used to examine the extent to which peoples' ability to participate in recreational activities is adversely affected by other commitments, such as long hours of work and the care of children. Internationally, there is a large body of literature that has drawn on time use data to examine trends in leisure over time and between countries, and to investigate differentials in the amount and use of leisure time between population groups, such as women and men, and parents and non-parents (Aguiar and Hurst, 2007; Ramey and Francis, 2009).

Evaluating the availability and use of time for leisure and recreational activities is possibly the most recurrent application of time use data and is at the centre of many discussions about the quality of contemporary life (Schor, 1993; Nowotny, 1994; Adam, 1995; Robinson and Godbey, 1997). Leisure time is most commonly referred to as the free time available to people after they have fulfilled their work (paid and unpaid) and personal care commitments, while recreation consists of the activities that people engage in during their leisure time (Szalai, 1972). Leisure time gives people the opportunity to recover from the pressures of work and other commitments and to pursue their own interests, while the participation in recreational activities enables people to develop their skills, talents and knowledge, and can provide them with a sense of identity and personal autonomy. Recreational activities such as sports and active leisure can enhance the overall health of individuals by contributing to a reduction in physical and mental health problems such as high blood pressure and depression. Thus, a lack of time for such activities can result in the deterioration of the overall health of individuals and can impact adversely on societal well-being. Time use diaries provide unprompted evidence of the incidence and duration of episodes of formal exercise e.g. sports participation and going to the gym, which are rather lower than those that emerge from dedicated exercise surveys (Harms and Gershuny, 2009). The discrepancy between diary and questionnaire estimates may relate to social desirability effects in response to questions investigating sports activity. Time use data also reveal the extent of informal exercise (e.g. walking to the shops, dancing) that takes place in the course of daily life, but is frequently missing from more focused surveys.

Time use data can also be used to analyse two seemingly contradictory theories: the phenomenon of 'leisure time poverty' due to economic development and the increasing level of involuntary leisure in the form of unemployment (Gershuny, 1986; Bittman, 1998; Friedberg and Webb, 2005). One of the consequences of economic development is time

scarcity, resulting in people feeling more harried and believing that their leisure time has become more scarce (Linder, 1970; Frederick, 1995; Robinson and Godbey, 1997). Some of the developments that have contributed to this are the shift away from the normal forty-hour week over five working days towards more flexible working arrangements and the increase in the number of dual-earner families. Gershuny (1986) views unemployment not so much as leisure but as 'empty time' as those without a job have time, but not the resources for leisure consumption, while the 'harried havers' are without sufficient leisure time to employ the leisure services available to them.

A relatively new research area for time use data is investigating the quality of leisure time. This has involved the construction of new measures, such as: whether the leisure activity was undertaken as a simultaneous activity; the extent to which the leisure episode was interrupted by other activities; and the proportion of leisure time devoted to adult leisure activities. While studies of time use data suggest that women and men enjoy similar amounts of leisure time, when the analysis is extended to include measures of the quality of leisure time, it suggests that men enjoy higher amounts of uninterrupted leisure than women (Bittman and Wajcman, 2000).

A review of the literature on leisure and recreation reveals that there is a large body of literature that has drawn on time use data to examine differentials in the amount and use of leisure time across population groups. However, studies investigating the allocation of time across different categories of leisure of a population subgroup are limited. Thus, with the intention of addressing this gap in the literature, Chapter 9 examines the factors that influence both the participation in and the number of hours dedicated to leisure activities among farm household members in the West of Ireland. It also investigates the diversity of participation in various types of leisure activities, namely: active leisure, passive leisure and social entertainment.

3.4.6.2 Social – Culture and Identity

By providing an insight into the cultural preferences of a population, time use data provides an opportunity to study the impact of different events on a community or a nation. Culture

has close links with leisure, as many activities are both cultural and leisure activities (e.g. watching a film or visiting a museum). Cultural activities are important in developing national identity and forming community networks and bonds crucial to social cohesion. Time use diary information can also be used to monitor the amount of time people spend on cultural activities, and the proportion of their free time that is spent on these activities. For example, data from the 1998/1999 New Zealand Time-Use Survey (n=8,500) was used to produce a pamphlet on the time New Zealanders spent on cultural activities. It demonstrated the value of the diaries for producing estimates of time spent on popular cultural activities (such as watching television or videos, or listening to the radio). However, it also highlighted some of the limitations of diary data for measuring some types of cultural activities, particularly those that are undertaken on a relatively infrequent basis (Statistics New Zealand, 2010).

3.4.6.3 Television Time and Other Media

One of the most developed and regularly applied fields of time use research is the monitoring of media use. Viewer or listener preferences are an important part of television and radio planning and are also a key to the placing of advertisements. In some countries, radio and television companies have their own public opinion research institutions which perform time diary surveys on a regular basis e.g. in Japan (Nakanishi, 1963; 1982) and Korea (Kim *et al.*, 1982). Recently, researchers have come to realise that the time diary method is a more adequate and sophisticated method of measuring internet use and analysing internet usage patterns than conventional methods (Ishii, 2004). Time use studies also offer detailed information on the role of media in people's lives. Data on media usage from time use studies has been used to test empirically if watching television, listening to the radio, reading newspapers, etc. are linked to higher life satisfaction. Frey and Benesch (2008) present empirical research on media use by Europeans, suggesting that watching TV is related to less happiness, while listening to the radio and reading newspapers is related to higher life satisfaction.

3.4.6.4 Civic Participation and Voluntary Activity

Civic engagement is action by individuals or collectives designed to identify and address issues of public concern. Civic engagement can take many forms, from individual voluntarism and organizational involvement to electoral participation. It can include efforts to directly address an issue, work with others in a community to solve a problem or interaction in a range of specific activities or organisations such as trade unions, residence or professional alliances, political parties, parish groups, farm related associations or writing a letter to an elected official or voting. Putnam (1995; 2000), for example, has used the extent of volunteering as one indicator of civic engagement. Volunteering is essentially the commitment of time and energy, for the benefit of society, local communities, individuals' outside the immediate family, the environment, or other causes (Freeman, 1997; Carr, 2001). Voluntary activities are undertaken of a person's own free will and are performed without monetary recompense. There are two distinct classes of voluntary activity, formal and informal. Formal volunteering is work carried out by individuals through formally recognised organisations such as Goal or The Simon Community. Informal volunteering refers to a wide range of mutual help and cooperation between individuals within communities without going through an organisation, for example shopping, cleaning or doing farm work for a sick or elderly neighbour, or coaching a local sports team. Formal voluntary work, through organisations, and informal volunteering, by helping other households, plays an important role in the delivery of socially important goods and services by supplementing the basic services of the welfare state in a functioning civic society. Almost all previous research has focused on formal volunteering, and thus there is a gap in the literature relating to the examination of the factors that influence participation in informal voluntary activities. One of the aims of this thesis is to address this gap in the literature.

Time use data depicts how various civic and voluntary activities are integrated in the lives of different sections of the population. A large amount of unpaid work takes place in communities, producing a range of important goods and services. For example, people run sports clubs, do administration for schools, care for older people with disabilities and transport those who are unable to transport themselves. In line with this, there is growing awareness of the economic value of such unpaid work in the extensive literature that exists on volunteering. For example, a number of researchers have used time use data to examine the

issue of civic participation and voluntary activity. For example, Vaillancourt (1994); Reed and Selbee (2000); Carlin (2001); Carr (2001); Nakano (2005); and Hall *et al.* (2006) have all used time use data to examine the characteristics of people in society that are more likely to participate in various community and voluntary activities, be they formal or informal, while Smith (1994) and Freeman (1997) have looked at the factors that induce people to participate in voluntary activities. As demonstrated by Carlin (2001) and Garcia and Marcuello (2002), time use data is also useful in the examination of the choice of the number of hours that an individual volunteers. Brick *et al.* (2007), for example, examined both the participation in and the number of hours dedicated to community and voluntary activities by farm couples in an Irish region (n=276), though they did not use time use diary data in their analysis. A more detailed discussion of the literature relating to civic participation and voluntary activity can be found in Chapter 8, which presents an analysis of the factors which affect participation in civic engagement and voluntary activities and the choice of how many hours to dedicate to civic engagement and voluntary activities.

3.4.7 Personal Care and Travel/Commuting Time

Much of life is spent on activities that seem basic, ancillary, or necessary to complete other activities. Personal care and travel, which according to Robinson and Godbey (1997) consume nearly half our lives, fall mainly in this category. In order to function, we need to sleep and eat, wash, brush our teeth and dress ourselves; we need to get to places of work, to food stores and to other market and service providers. As governments develop policies to discourage people from spending time on certain activities, e.g. smoking, or to encourage them to participate in others, e.g. physical fitness programs, it is necessary to have evaluative measures and time use data for implementing and evaluating change in such areas.

Although seemingly of minimal policy interest, differences in daily time spent on personal care among the aged and less healthy segments of the population can reflect important changes and differences in the quality of life of these individuals in society (Pentland *et al.*, 1999). While probably the least interesting time use categories because they ultimately refer to the simple maintenance required of all human beings and provide minimal opportunity for

individuals to be productive or expressive, depending on the individual and the culture, such basic activities in life can be subject to considerable flexibility and variability.

The examination of individuals' travel patterns and behaviour for a variety of policy, program, and marketing purposes, is another successful application of time use data. Travel data is collected and analysed to determine the factors that influence the choice and frequency of trips, the amount of time that people spend travelling and the mode of transport that they choose. This data is used for the purpose of travel demand forecasting, to determine whether travel infrastructure capacity is sufficient, determining if individuals' travel is more or less energy efficient over time, and determining optimal locations for retail establishments. The need to develop an enriched understanding of day-to-day travel behaviour was recognised in the mid-1970s by travel behaviour researcher Chapin (1974). It was subsequently noted by Jones *et al.* (1983); Janelle *et al.* (1988); Solberg and Wong (1992); and Hertkorn *et al.* (2003) that time use data provides a valuable input into the study of travel behaviour as a properly detailed diary will reveal the times that people spend not only in automobile versus mass transit, but also additional travel accomplished by other means, such as walking or biking. Examples of travel studies using time use data include that of Boarnet and Crane (2001) who studied the travel activities of households in Orange County and San Diago using two-day travel diaries from 1993 and 1996. The aim of the study was to determine what influence the land use pattern of Orange County and San Diago had on travel behaviour (n=7,469). In another study, Newbold *et al.* (2005) use Canadian 24 hour time use diary data from 1986, 1992 and 1998 to study the travel behaviour of the older population in Canada (n=9,946, 8,996, 10,749). More recently, Hamrick and Hopkins (2012) estimate the time cost of access to food in the United States by measuring the distance to the grocery store in minutes (n=11,726) and found that individuals living in low-income areas with limited supermarket access spend significantly more time travelling to grocery shopping than the national average and, in addition that they grocery shop less frequently.

3.4.8 Social Connectedness

Social connectedness refers to the relationships people have with others and the benefits those relationships bring to the individual as well as society. People who feel socially

connected are generally happier, healthier and better off than people who feel socially isolated (Putnam *et al.*, 2012). People who feel socially connected also contribute towards building communities and society. Time use data can be used to illustrate the amount of time spent on activities such as sport, civic participation, going to social clubs and pubs, visiting friends and family, as well as being engaged in voluntary associations and local politics, all of which are described by Hall (1999) as 'pursuits associated with social capital'. The term social capital describes important social processes and relationships, informal social networks, friendship, neighbourhood generosity, interpersonal trust and volunteering activity, but also aspects of local and community development, public-private-voluntary partnerships and civic spirit. There are a number of inter-related and overlapping key dimensions of social capital: community engagement; community efficacy (a shared sense of empowerment and capacity to effect change at the community level); volunteering; political participation; informal social support networks (e.g. who knows who); informal sociability (speaking, visiting, writing, emailing); norms of trust and reciprocity; and trust in various institutions (corporate, public, voluntary).

Thus, social connectedness builds social capital and social capital is generally viewed as having a positive impact on community and individuals (Knack and Keefer, 1997; OECD, 2001; Putnam, 2001; Brennan and Luloff, 2007). Time use data is invaluable in measuring the frequency and characteristics of social interactions of people in various settings. This is crucial in terms of evaluating the functioning of basic social constructs, such as family, by shedding light on the time spent with family members. Analysing data from the American Heritage Time Use Study and other nationally representative datasets, Putnam *et al.* (2012) studied the class gaps in social connectedness among youths in America. Harvey *et al.* (2006) analysed the time use diaries of people with schizophrenia living in London with the aim of identifying strategies to improve social connectedness (n=192).

3.4.9 Energy Consumption/Individual Exposure to Environmental Risk

Time use methodologies can furnish researchers with superior data, supporting a better understanding of individuals' patterns of energy consumption and use of technology. This is achieved by the generation of information on the use of cars, other motor vehicles, televisions,

computers and other energy-consuming devices. In particular, the continuous and sequential observations in time use diaries provides a comprehensive source of information on individual exposure to environmental risk and energy consumption. Such data has the potential to reveal the traits of and the context within which, individuals use these technologies and whether these technologies are more likely to be used by isolated individuals, or by groups. It can also be used to explain and predict future energy use. The setting variable included in many time use diaries permits analysis of the amount of time people spend on different modes of transport, and potentially, the time spent indoors and outdoors. Time use data on energy can be used to model changes in behaviour associated with changes in energy use, thereby improving campaigns targeting reductions in energy usage and the marketing of new energy saving products and devices (Fisher, 2001).

Time diary studies are also used in the US for estimating exposure to sunlight (Klepeis *et al.*, 2001) and by the Environmental Protection Agency for assessing environmental toxins and pollutants (Ott, 1989; Jenkins *et al.*, 1992; Silvers *et al.*, 1994; Robinson and Silvers, 2000). In addition, they are used for the purpose of predicting fuel demand deriving from private individuals and household travel, space heating, cooking and leisure activities. Another application of time use diary data in this area is the analysis of the impact of distance working (i.e. working from home) on energy use. A study by the Danish Transport Council (1998) concluded that it reduces transportation and saves energy.

3.4.10 Measurement of Health Outcomes

Time use data is increasingly being used by medical professionals to examine the behavioural patterns of individuals with various medical conditions including physical and mental disabilities. An analysis of how people allocate their time to activities, places and interactions provides occupational therapists with a better understanding of the impact of disabilities on a patient's activity participation. Devries (1997) discerns that comparing patterns of time use of people with disabilities with that of the general population can identify where their activity participation is restricted or constrained i.e. the disabling consequences of their illness. Yerxa and Baum (1990) used activity logs to compare the quality of time use of community based adults with spinal chord injuries with that of a group of non-disabled individuals of the same

age and sex (n=27). Similarly Pentland *et al.* (1998) used interviews and time diaries to provide preliminary descriptive and analytical information about the time use patterns of men with spinal chord injuries living in the community (n=312). They examined the relationship between the severity of the disability, time use, social support and socio-economic status, as well as psychosocial outcomes, specifically life satisfaction, perceived health and adjustment to disability. Harvey *et al.* (2006) analyse time use data from a sample of people with schizophrenia living in North London (n=192). The aim of their study was to identify illness-related and socio-demographic predictors of participation in occupations and their implications for improving social inclusion. Hayes (2000) and Farnworth (2003) note that by gaining expertise on the application and relevance of time use research, occupational therapists can make significant contributions to health research as time use data can be a major indicator of a person's quality of life.

3.4.11 Time Use of Rural Households

Time use studies have also been used to provide a more accurate picture of activities in rural areas where non-market work is prevalent, particularly in developing countries (Acharya and Bennett, 1981). They also contribute to the gender debate in agriculture by adding insight into the substantial heterogeneity, among and within countries, in the contribution of women to agriculture and rural enterprises across developing countries. Raney *et al.* (2011) study the areas and the degree to which women participate in agriculture and in rural labour markets. The study of time use has also been used to examine whether the microcredit strategy is successful in improving the livelihoods of women. A distortion in the allocation of women's time is used as an indicator of an improvement or disimprovement in their livelihood. Garikipati (2012) examined the impact of microcredit on the time use of males and females from rural India and analysed the link between credit and women's empowerment. The central aim of microcredit is to support poor women across the developing world, thus, improving their livelihoods. Erdil et al. (2006) analyse rural household work and leisure time in Turkey and look at how time use is allocated among various activities and by socio-economic characteristics of individuals. Other studies of rural areas have looked specifically at the time use of the elderly (Cain, 1991), the household income diversification for rural non-farm labour (Reardon and Fafchamps, 1997), and the effect of a gender targeted

conditional cash transfer program on time allocation mothers in rural households (Hasan, 2010).

3.5 Econometric Analysis of Time Use Data

Time use data is distinctive. It is episodic in nature, consists of both continuous and discrete values (exact zeros), is non-negative and generally right skewed. As a result, there are several challenges when attempting to analyse time use data using econometric methods. The large number of zero responses in time use data is a common problem for data analysts and has attracted considerable attention in the literature (Flood and Gråsjö, 1998; Klevmarken, 1998; Juster, 1999). There are two sources of zero observations that reflect the respondents' behaviour and the nature of the data collection method. First, there are individuals that never participate in particular activities, and therefore zeros are recorded in the diary (*structural zeros*). For example, someone who is unemployed will report zero hours of paid work. Second, zeros can also arise because there are individuals who usually participate in an activity but for some reason did not participate on the selected diary day (*sampling zeros* - emphasising the importance of the design of the time use survey). Reverting to the work example, respondents may be sick or on holiday or they may not work on the specific survey day. The problem is to distinguish one from the other and to control for the prevalence of these zero observations in the econometric modelling. A second challenge in the analysis of time use data is the choice of econometric model that accounts for the sequential and possibly interrelated decisions faced by individuals: 1) whether or not to participate in a particular activity and 2) how much time to allocate to that activity.

A variety of statistical techniques are used to analyse time use data, including linear regression models. The limitation of the linear regression model is that the assumption of normality is violated because of the existence of large numbers of exact zeros and the data being right-skewed. The zeros present a particular problem in standard regression models because there is no way of transforming the data to produce a normal distribution; the zeros are simply transformed en masse to another value. To this end, the prevalence of zero observations in time use data and the decision problems outlined are usually handled by the application of either a standard Tobit (Type I) model (Tobin, 1958), sample selection models

such as Heckman's two-stage estimator model (Heckman, 1974; 1976; 1979; Dubin and Rivers, 1989) or double-hurdle models, also known as two-part models (Cragg, 1971; Duan *et al.*, 1983). Each of these models represents a more refined method of taking into account the process by which zero observations are generated.

In the Tobit model, the censoring is taken into account in the distributional assumptions concerning the parameters to be estimated. Sample selection models such as Heckman's two-stage estimator, sometimes referred to as a generalised Tobit or Tobit-II model, account for the zero observations by specifying, alongside the outcome equation, a probit selection equation, which models the determinants of zeros. Originally formulated by Cragg (1971), the double-hurdle model is the most straightforward. It attempts to take into account both structural and sampling zeros by specifying two selection equations or hurdles. The first hurdle accounts for the zero observations caused by the behaviour of the respondent, and the second for modelling the zeros caused by the sample design. Cragg's original model is based on the assumption of independence between the participation decision and the structural equation, but this assumption was dropped in later applications (Blundell *et al.*, 1987; Blundell and Meghir, 1987; Jones, 1989; 1992; Carlin and Flood, 1997; Blundell *et al.*, 1998). Flood and Gråsjö (1998) conclude that the estimates of the double hurdle and sample selection models are sensitive to the model specification. They report that Tobit models are appropriate when these models cannot be accurately specified. What follows is a brief description of each of these models.

The traditional approach to dealing with zero-inflated data, yielding a censored dependent variable, has been to use the standard Tobit model (Sayer *et al.*, 2004; Kalenkoski *et al.*, 2005; Kimmel and Connelly, 2007). Originally formulated by James Tobin, the model allows the incorporation of all observations including those censored at zero, without considering the sources of the zeros. As this ignores the zero observations due to respondents' non-participation decisions, the underlying assumption is that the same factors that affect the probability of participation also explain the level of participation (time spent participating). In other words, the model assumes a single decision process for which non-participation ($m_i^* = 0$) is an actual corner solution. In the case of the Tobit model, the latent endogenous variable m_i^* for the desired level of participation (minutes participating) of person i is described by:

$$m_i^* = X_i\beta + \varepsilon_i \quad \text{with} \quad \varepsilon_i \sim N(0, \sigma^2) \tag{15}$$

Where

$$m_i = \begin{cases} m_i^* \ if \ \ m_i^* > 0 \\ 0 \quad if \ \ m_i^* \leq 0 \end{cases} \tag{16}$$

and m_i is the corresponding actual observed time spent participating. X_i is the vector of explanatory variables that explains both the participation decision and the level of participation and β is the corresponding vector of parameters to be estimated. In this model ε_i is assumed to be a homoskedastic, normally distributed error term.

Equation (16) states that the observed number of minutes become positive continuous values only if a positive number of minutes is desired, otherwise it equals zero. Since there is no negative number of minutes, the censoring could be placed at zero without any loss of generality (Wodjao, 2007). This shows that the observed 0's on m_i can mean either a 'true' 0 (i.e. due to the individuals deliberate choice) or a 'censored' 0 (i.e. those caused by the data collection method). The standard Tobit model is estimated using maximum likelihood methods where the likelihood function is given by:

$$L = \Pi_{m=0}\left(1 - \Phi_1\left(\frac{x_i\beta}{\sigma_m}\right)\right)\Pi_{m>0}\left\{\frac{1}{\sigma_m}\phi\left(\frac{m_i - x_i\beta}{\sigma_m}\right)\right\} \tag{17}$$

where Φ_1 is the normal cumulative distribution function and ϕ is the density function of the normal distribution.

The assumption that the same stochastic process determines the decision to participate and the level of participation is quite restrictive. In many cases, the process by which the level of participation is determined is entirely dependent on factors other than the decision to participate. Therefore, while a Tobit model does allow one to estimate the contribution of various independent variables to the level of participation, it restricts the coefficients on these variables to be the same regardless of whether or not an individual participated (Daunfeldt and Hellstrom, 2007; Stewart, 2009). What is more restrictive is that the Tobit approach

assumes that factors affect in the same direction (Amemiya, 1984; Sigelman and Zeng, 1999). One final concern of the application of the Tobit model to time use data is that the Tobit model is sensitive to violations of the assumptions of normality (Arabmazar and Schmidt, 1982). Following analysis of the assumptions of the Tobit model, Marin-Galiano and Kunert (2005) conclude that the normality of the latent variable m^* is crucial for the asymptotic distribution of the parameter estimates of β to hold. Due to these shortcomings, the Tobit model has usually been rejected when using time use data.

Alternatively, a well-developed class of econometric model, the sample selection model, is frequently used to detect and correct for sample selection bias. One of the earliest sample selection models, Heckman's (1976; 1979) two-stage estimator and its subsequent variants (Van de Ven and Van Praag, 1981; Achen, 1986; Dubin and Rivers, 1989) treat the issue with selection as an omitted variable problem. The models allow one set of variables to determine the probability of participation and a second set to determine the level of participation. While the standard Tobit assumes a single decision process, the Heckman two-stage estimator presumes two interdependent decisions allowing the censoring function and the uncensored time function to have different coefficients and correlated errors in participation and time allocation models.

The first stage of Heckman's (1979) two-stage procedure, a probit model, is estimated for the binary choice between participating and not participating (index equation), and the inverse Mills' ratio (IMR) is calculated for each respondent. The IMR is the ratio of the probability density function to the cumulative distribution function of a distribution. In the second stage, the least squares regression (OLS) for participants is estimated (structural equation), including the IMR as an additional independent variable and adjusting the standard errors for hetroskedasticity. Based on these specifications, the standard Tobit can be modified following Heckman (1979) and Flood and Gråsjö (1998; 2001) as:

$$p_i^* = \mathrm{x}_i\beta + \varepsilon_{1i}, \text{where } p_i = \begin{cases} 1 & if \ p_i^* > 0 \\ 0 & if \ p_i^* \leq 0 \end{cases} \qquad \varepsilon_1 \sim N(0,1) \tag{18}$$

$$m_i^* = z_i\gamma + \varepsilon_{2i}, \text{where } p_i = \begin{cases} 1 & if \ p_i^* > 0 \\ 0 & if \ p_i^* \leq 0 \end{cases} \qquad \varepsilon_2 \sim N(0,\sigma^2) \tag{19}$$

and corr $(\varepsilon_1, \varepsilon_2) = \rho$

In this specification, p_i^* is a latent (non-observed) index variable that represents the binary censoring, while p_i is the observed value representing the individual's participation decision (i.e. if 1 it means the respondent is reporting a positive number of minutes ($p_i^* > 0$), else 0). Hence, the actual observed number of minutes m_i equals the unobserved latent value m_i^* only when a positive number of minutes is reported: otherwise, it takes the value of 0. x_i and z_i are vectors of explanatory variables that determine these two-stage decisions respectively, and β and γ are the corresponding vectors of parameters.

Since OLS is used in the second step, the interpretation and testing of the estimated coefficients proceeds as usual, the only difference being that the estimates are now unbiased and consistent. Second, since the coefficient of the IMR is directly related to the correlation between the errors in the participation model and time allocation model, insignificance of this coefficient indicates that there are no unobserved factors affecting both the daily participation and time use decisions. Consequently, the Heckman procedure would add no more information than simply running the two regressions separately and the model reduces to the simple double-hurdle or two-part model.

Unfortunately, the power of the t-test on the coefficient of the IMR may be limited (Leung and Yu, 1996), since the Heckman approach may seriously inflate standard errors due to collinearity between IMR and other independent variables (Puhani, 2002; Sartori, 2003). Sartori (2003) pointed out that the selection procedure is appropriate only if there exist exclusion restrictions, in other words, at minimum one independent variable that affects the participation decision (included in first stage) but does not affect the time use decision (excluded from the second stage). Leung and Yu (1996) maintained that in the absence of this, collinearity between the regressors in the time allocation model and the IMR is the decisive criterion for selection between the Heckman and two-part models. If $\rho = 1$ then the standard Tobit model emerges. If $0 < \rho < 1$ then some selection process is taking place and the Heckman model provides insight into the process.

The most straightforward approach to model sequential participation and time-use decisions is with the use of a double-hurdle or so called two-part model. The model suggests that two separate hurdles must be passed before a positive dependent variable is observed. The first hurdle relates to whether or not the individual participates and the second refers to the level

of participation conditional on participation being positive. The index (participation) and structural (level of participation) equations of the double-hurdle model resemble those of the Heckman model. However an interesting modification is obtained by explicitly considering that m is censored at 0. This model can also be denoted a Tobit model with selectivity (Flood and Gråsjö, 1998).

A slight modification of the threshold structural equation (19) gives the double-hurdle model:

$$m_i = \begin{cases} m_i^* & if \quad p_i = 1 \quad and \quad m_i^* > 0 \\ 0 \; else \end{cases} \tag{20}$$

This indicates that the observed number of minutes m_i is zero either when there is censoring at zero ($t_i^* \leq 0$) or if there is faulty reporting, or due to some random circumstance. If information on the censoring is available, the likelihood function for the double-hurdle model can be written as:

$$L = \Pi_{m=o}\left\{1 - \Phi_2\left(x_i\beta, \frac{\mathrm{z}_i\gamma}{\sigma_m}, \rho\right)\right\} \quad \Pi_{m>0}\left\{\Phi_1\left\{\frac{x_i\beta + \frac{\rho}{\sigma_m}(m_i - z_i y)}{\sqrt{1-\rho^2}}\right\}\frac{1}{\sigma_m}\phi\left(\frac{m_i - z_i y}{\sigma_m}\right)\right\}$$

where Φ_2 is the bivariate normal cumulative density. This corresponds to the formulation presented by Jones (1992) in which hurdles are not independent.

The double-hurdle and the Heckman estimator models are similar in identifying the rules governing the discrete (zero or positive) outcomes. Both models recognise that these outcomes are determined by the participation and level of participation decisions. They also permit the possibility of estimating the first and second stage equations using different sets of explanatory variables. However, the Heckman model assumes that there will be no zero observations in the second stage once the first stage selection is passed. In contrast, the double-hurdle considers the possibility of zero realisations (outcomes) in the second-step arising from the individual's deliberate choices or random circumstances. This is the main difference between the two models.

There is a well established literature concerning the merits of the double-hurdle models versus sample selection models such as Heckman's two-stage estimator. Among the most prominent contributors to the discussion on the appropriate choice of model are Duan *et al.*

(1983); 1984), Leung and Yu (1996), Puhani (2002), Dow and Norton (2003), Sartori (2003), Madden (2006) and Wodjao (2007). Thus far, there has been no general agreement on the correct approach to dealing with the zero-value observations or the selection bias that time use data generates. There is, however, some consensus on the criteria for the selection of the correct model for the given data. For example, Sartori (2003) noted that selection models are reliable and appropriate only if there are exclusion restrictions. An exclusion restriction is needed to avoid collinearity problems between the IMR and the other independent variables. Unfortunately this 'extra' exogenous variable often does not exist. It is possible to estimate the selection models without the extra variable, but the results are then based upon the acceptance of the distributional assumptions of the residuals rather than upon variation in the explanatory variables. Thus, when theory dictates identical explanatory variables in the two equations, one is left with a choice: to find an extra explanatory variable for the selection equation (leading to specification error if the variable does not belong there) or to identify only from distributional assumptions about the residuals.

Following Dow and Norton (2003), Madden (2006) indicates that the choice between available approaches rests on three criteria: theoretical, practical and statistical. Theoretical criteria relate to the detailed objectives of the study and Madden (2006) asserts that the initial consideration of the researcher should be to ascertain whether they are modelling potential or actual outcomes. Following that, if the focus of the study is on the marginal effects of covariates on actual participation, as opposed to potential participation, the double-hurdle model would be more appropriate. Heckman's (1976; 1979) sample selection model is discounted because when first introduced, it was in the context of wage estimation (i.e. the potential outcome was being modelled). Practical criteria pertain to model specification, characteristics of sample design and other practical details, such as the existence of exclusion restrictions required by Heckman's two-stage estimator model. Akin to Sartori (2003), Madden (2006) pointed out that in the absence of an exclusion restriction, separate identification depends upon the non-linearity of the IMR which appears in the hours participation equation. The issue is that the IMR is frequently an approximately linear function over a wide range of its argument and so estimates from the level of participation equation in the sample selection model may be non-robust owing to collinearity issues. Finally, statistical criteria consist of available statistical tests which would enable one to discriminate between the two models. Madden (2006) used the empirical mean square error

(MSE) test proposed by Toro-Vizcarrondo and Wallace (1968) which involves calculating the empirical MSE of each estimator under the assumption that the model in question is the 'true' model.

Leung and Yu (1996) ascertained that the collinearity between the regressors in the level of participation equation and the IMR is the decisive criterion for selection between the sample selection and two-part models. They also point out that the presence of such collinearity problems limits the power of the t-test for sample selectivity on the coefficient of the IMR (a test which is sometimes used as a criterion for model selection). They recommend testing for collinearity in the level of participation equation and if it exceeds 20, the two-part model is considered more robust. However, if it is less than 20, the selection model may be used. Madden (2006) suggests that the choice of 20 as a 'critical' value is arbitrary and notes that there are other diagnostics which can provide a more thorough investigation of collinearity.

More recently Gershuny (2012) set out to address the problem of too many zeros by outlining a method for estimating long-term time use from short diaries. He notes that while short diaries have many non-participants in infrequent activities, longer diaries impose much higher levels of respondent burden, leading to unacceptably high levels of non-response. Thus, Gershuny (2012) sets out a method for combining 'habit' indicators and diary methods to provide reliable long-term estimates of time use. He concludes that this method, though imposing a strong data requirement, improves estimates of time use, and in particular enables the estimation of the distribution of infrequent activities across individuals.

In line with this, it is evident that the choice of the most appropriate approach is highly case specific and depends largely on the activity under consideration, the assumptions about the zero generating process and the specific objectives of the study. The appropriateness of the Heckman two-stage model depends largely on practical issues because the interpretation of Heckman estimates is very sensitive to the model specification. In real life, the assumption of independent disturbance terms is highly uncertain because of specification problems related to sequential participation and time use decisions. Even if the correlation between the disturbance terms is calculated in the Heckman two-stage procedure, the independence of error terms cannot be directly tested before model specification. Following Madden (2006), numerous tests can also be applied to aid the choice of the most appropriate model.

3.6 Caveats of Time Use Research

There are a number of caveats or limitations of time use studies in measuring and monitoring participation and levels of participation in various activities and their resulting data that should be noted. Possibly the most serious is the nosiness of the data due to short collection periods. Short collection periods are preferred by researchers because longer diaries, covering 2-3 days, are overly burdensome on the respondent culminating in a decline in diary quality and an increase in non-responses. This creates a number of problems, such as the frequency of zero observations, even in the case of often performed activities. Likewise, activities that are seldom performed are under-reported. Weekly and seasonal variations also affect the reported figures and with just a few observation points, the weekly and seasonal variations are difficult to separate (Klevmarken, 1998). In the case of small scale special purpose studies that focus on specific population groups, time use surveys, being time consuming and sometimes cumbersome, can prove difficult to return a large sample, and therefore special purpose time use surveys are usually small sample surveys. This tends to raise sampling errors on the one hand and limits the possibility of a detailed breakdown of the data on the other hand. Fortunately, improvements in data collection methods and modelling techniques can help to overcome some of the main difficulties with time use data. The advancement in modelling techniques, particularly in the econometrics of limited dependent variables, has also led to more robust analysis of time use data.

Data collected by surveys in general tends to be sensitive to measurement errors and time use data is no different. Measurement error arises from respondents' incorrect answers to survey questions and can be either random or systematic. Random errors originate from unclear questions, deterioration of the interviewees' motivation or attention, or from some other factor that causes randomness in answering interview questions. In large samples, cases of random error cancel out each other and do not affect the means. However, they increase variation in variables and thus weaken the dependencies between them. Systematic error on the other hand influences the means of results. The magnitude of systematic error often varies depending on the population group, and also produces errors in the dependencies between variables. In short, while the time use survey technique has the potential to help researchers to understand human activity patterns, it has its limitations. Nonetheless, because many of the

limitations can be overcome through design, it is the most suitable data collection technique for this research.

3.7 Reliability and Validity of Time Use Estimates

When choosing a research methodology, two important properties one must consider are reliability and validity. Reliability refers to the ability of an instrument to provide consistent results from study to study and under various conditions. Validity refers to the ability of an instrument to provide accurate or valid data in the sense that it is consistent with estimates provided by other research methods (such as observation or beeper). A number of methodological studies have been undertaken that look directly at the reliability and the validity of the time diary method. With regard to reliability, Robinson (1977) produced reliable and replicable results between time use patterns found in the 1965-66 national time diaries (n=1,244) and the aggregate figures for the single site of Jackson, Michigan (n=788). Similar results were reported by Harvey and Elliott (1983) using American data and data from Canada in 1971 and 1982. In a study of time diaries, Kalton (1985) presented reliability proportions for various activities including market work (88%), shopping and administration (45%) and home improvements and spectator events (zero). Reported probabilities are fairly low unless the activity is one that takes place regularly on a daily basis, in part due to the small number of observations on rare activities. Juster *et al.* (2003) suggest that in order to obtain reliable estimates using time diaries, researchers can use multiple diaries. This, however, has its limits as most respondents are unwilling to fill out a large number of diaries (Gershuny, 2000), unless they can do so over a longer period of time (Juster, 1985b)[13]. If this limit poses a problem, the reliability of time diaries can be improved by altering sample design. When considering a sample design that will produce reliable estimates, Juster *et al.* (2003) recommends that one should determine whether the aggregate distributions of activity are the central concern (in which case maximising the sample of individuals is the optimal design), or whether understanding the factors that drive micro behaviour is the main concern

[13] Additionally, collecting diaries from the same respondents over a long period of time brings with it another set of problems: sampling variability becomes indistinguishable from real change in time spent on an activity over the life course.

(in which case multiple time diaries that include multiple days for the week and multiple people in the household is probably best).

Almost all diary studies depend on the self-report method, rather than on some form of observation, leaving the data open to questions about validity. Several studies have been found that bear directly on the validity of the time diary, in the sense of there being an independent source or quasi-observer of reported behaviour. According to these validity studies, time diaries as a method of data collection, produce, for most activities, data that is consistent with real behaviour and which is not subject to misunderstandings, recall problems or altering tendencies in the way that some of the other data collection methods are. A study by Robinson (1985b) that compares the data from a random sample of 60 residents of Ann Arbor and Jackson, Michigan, who kept beepers for a one-day period and also completed time use dairies, found that activity durations had a strong correlation across both data collection methods. Presser and Stinson (1998) found that church attendance reported in time diaries were consistently lower than those reported on an estimate basis. This finding is consistent with that of Hadaway *et al.* (1993) who conducted an observational study of actual church attendance at the community level. In line with these findings, Presser and Stinson (1998) conclude that time use diaries are more reliable than conventional estimate studies.

3.8 Summary

In summary, time use research has been used throughout this century to examine both objective and subjective aspects of human behaviour in a wide variety of fields and purposes. In recent years, the methodology has become increasingly sophisticated, both in terms of collection and analysis. The aim of this chapter was to highlight the various instruments and methods available for the collection of activity and time use data and choose the optimal approach for capturing activity data for the purpose of this research. The time diary is a micro-behavioural technique for collecting self-reports of an individual's daily behaviour in an open-ended fashion on an activity-by-activity basis. The time diary provides the opportunity to carry out a wide range of studies, explore a wide variety of issues, and present temporal and activity information in many different ways. Thus, the time diary method is

considered the most accurate and effective tool for obtaining data on time allocation, and hence is considered the best method for studies such as this thesis.

There are a variety of potential applications of time use studies such as economic accounting, labour force analysis, intra-household division of time, and energy consumption and individual exposure to environmental risk. Identified in this chapter are gaps in the literature relating to the analysis of leisure and voluntary activities that this research can address. The large number of zero responses and the choice of appropriate econometric model are challenges related to the analysis of time use data using econometric methods that are highlighted in this chapter. Following this, the most appropriate methods of dealing with these challenges are outlined and the criteria for the choice of the most appropriate econometric model are specified.

4. Time Use Survey Methodology

4.1 Introduction

Time use diaries are widely accepted as the most reliable means of collecting accurate and reliable time use data (Harvey and Spinney, 2000), are superior to less expensive substitutes (Robinson, 1985a; 1985b; Juster, 1986) and provide rich time use data. Thus, a time use diary combined with a questionnaire that collects information on the respondents' background characteristics was deemed the most appropriate method of data collection for this thesis. The survey instrument was developed from an analysis of a variety of other questionnaires and time use diaries. Standards and procedures for time use diary design, established by Eurostat (2008) and the United Nations (1999; 2005) and generally recognised within the field as successful practices, were adhered to. Experts in the fields of agriculture and time use data collection both nationally and internationally were consulted. These included representatives from Teagasc and the ESRI survey units, as well as the director and research team of the Centre for Time Use Research at Oxford University. Subsequent to the consultations with experts in the field and an analysis of the results of pre-tests and a small scale pilot study, a number of significant design changes were made to the final survey instrument.

This chapter presents a detailed discussion of the development and evolution of the survey instrument and the implementation process. Section 4.2 includes a detailed summary of the specificities of the survey instrument, the options available for each design consideration and the justification for each design choice. They included considerations and decisions in relation to site selection, survey administration approach, continuous recording versus fixed time intervals, open-ended versus pre-coded activities, ten or fifteen minute time points and the inclusion of contextual and simultaneous information. Included in Section 4.3 is an overview of the questions contained in the individual and household questionnaires and the motivation for the inclusion of each question. Finally, Section 4.4 outlines the process of pre-testing and piloting the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey* and describes the changes that were made to the survey instrument before its final administration.

4.2 Time Use Diary Design Considerations

4.2.1 Overview of the Survey Instrument

The survey instrument employed in this study consists of two individual time use diaries, an individual questionnaire and a household questionnaire. The first section, the individual time use diaries, target the time use patterns of the farm operator and their spouse, partner, parent, sibling or adult child for two different days of the week: one an ordinary weekday and the other a weekend day. The diary comprises of a table or grid containing a list of thirty activities from which the respondent can choose one primary and one secondary activity for each 15 minute episode of a 24 hour day. The diary runs from 4.00 a.m. to 4.00 a.m. the following morning, encompassing ninety-six 15 minute time 'slots' or 'grains' of time. The respondent is asked to record the duration of each activity, the place of the activity, with whom the activity is performed and if relevant, the second activity performed simultaneously for each of the two days. Each diary is accompanied by a set of six questions asking the respondent about the day to which the diary refers e.g. whether the diary day was unusual in any way. A copy of the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey* can be found in Appendix B

The second section of the survey, the individual questionnaire, is a series of twenty seven questions relating to the demographic and socioeconomic characteristics of the respondent, the time they allocate to farm and off-farm work, their involvement in community, voluntary and civic engagement activities, their health, quality of life and life satisfaction, and informal social support networks. The first two sections, the diaries and the individual questionnaire, take the form of a sixteen page (including the covers) double sided booklet (A4) printed on fine quality pastel green card (see Appendix B). The booklet begins with a sample diary and a set of instructions informing the respondent of how the diary should be completed. This is followed by the weekday and weekend day diaries and their respective end of diary day questions. The final section of the survey instrument, the household questionnaire, consists of questions relating to the structure of the household, the rootedness of the farm family, the farm profile, succession, as well as on and off-farm income, grants and subsidies. The

household questionnaire, takes the form of a double-sided sheet (A4) of fine quality green card[14].

4.2.2 Site Selection and Sample Design Issues

For time use surveys, there are three principal dimensions to sampling: the household, household members and time (hours, days and seasons). As outlined in Chapter 1, one of the objectives of this thesis is the collection of data on the allocation of time of farm household members in the West of Ireland by means of a small scale survey focused on a distinct area. Thus, farm households are the focal point of this research. The second objective of this thesis is the examination of the engagement of farm household members in civic related and voluntary activities. Ireland has a rich tradition of volunteering, with a large proportion (16.4%) of the national population (15 years and over) of Ireland involved in one or more voluntary activities at the time of the Census of Population, 2006 (CSO, 2006). Counties Galway, Sligo, Mayo and Roscommon were among the ten counties with the highest proportions of individuals involved in one or more voluntary activity. Additionally 4.8% of all of those that volunteered were farmers, even though farmers only make up 4.4% of the national population, and in 18.2% of all farmers in the population volunteered. Thus, the region encompassing counties Galway, Sligo, Mayo and Roscommon constitutes a rich study area in which to examine the level of engagement of farm household members in civic related and voluntary activities.

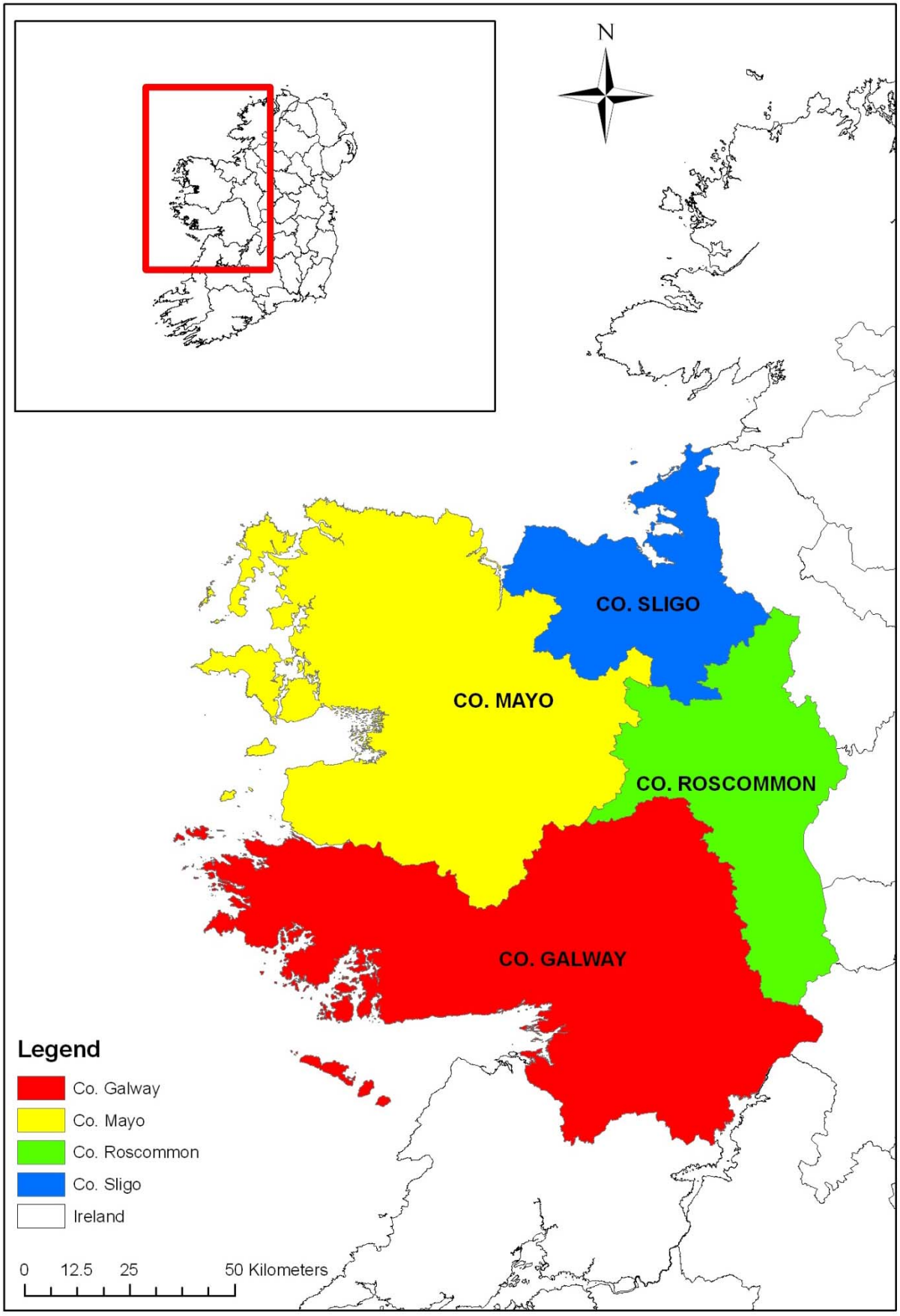
In view of the objectives of the research and in part, due to the availability of contact details for farm households in these counties, it was deemed appropriate to restrict the data collection to four counties: Galway, Sligo, Mayo and Roscommon (Figure 4-1). The optimal approach for sample selection is to select a random sample of farm households from the population of all farm households in the reference area. The Department of Agriculture, Food and the Marine, Teagasc, the Central Statistics Office (CSO) and various farm organisations were contacted in an attempt to obtain a population list of farm households in the relevant counties. However, due to issues of confidentiality, none of these sources could disclose this

[14] See Appendix B

information. Subsequently the sampling frame was extracted from the website of The Department of Agriculture, Food and the Marine which published a complete list of names and addresses by county of CAP Beneficiaries for the year 2008[15] (Department of Agriculture *et al.*, 2008).

[15] In line with the judgement of the Court of Justice of the European Union of 9 November 2010, this list was removed and subsequent information on farm level beneficiaries was prohibited from publication.

Table 4-1 Map of the Data Collection Site



An important sample design decision concerns whether or not to include all household members belonging to the reference population. The decision on whether there is a need to include more than one household member in the sample depends largely on the analytical objectives of the research and the constraints with regard to cost. Brick (2005) identified three types of farm household, the focus of this research, in the West of Ireland: (i) operator only, (ii) operator and spouse/partner and (iii) operator (no spouse/partner) living with parent(s), sibling(s) and/or children[16]. Each of the three types of farm household includes a farm operator, prompting the decision to request time use diaries and individual questionnaires from the farm operator of every household in the reference population. In the pre-testing and piloting of the survey, where a spouse or partner was present in the household, they too were asked to complete a time diary and individual questionnaire. In the case of every household that returned a survey instrument, a diary was returned for the farm operator, though in households where there was no spouse or partner present, a diary was occasionally returned from a parent, sibling, or adult child of the farm operator living in the household. As this research is focused on the time use of farm household members and the pre-testing suggested that household members in addition to the farm operator were agreeable to complete the survey, it was determined that two time use diary booklets and accompanying individual questionnaires be sent to every household and the farm operator and their spouse/partner, parent, sibling or adult child petitioned to complete a diary each. While Eurostat (2008) guidelines recommend that all persons 10 years and above residing in the household be included in the survey, budget restrictions dictated that only two booklets could be posted to each household. Hence, only two persons from each household could potentially be surveyed. However, the limitation on the number of household members sampled permitted an increase in the total sample of households surveyed.

The standard approach to choosing sample size can be applied to time use surveys in the usual way. However, there is the possible complexity of more than one unit of analysis: for person-day analysis the sample size is the number of person/days, for person-level analysis it is the number of persons, and for household-level analysis it is the number of households. What is important is that the sample is representative at the level for which the data is to be used (Hirway, 2007a). The main aim of this research is to collect and analyse time use data

[16] It is reasonable to assume that there is only one family living in each household in the West of Ireland.

from a sample of farm household members in counties Galway, Mayo, Sligo and Roscommon. The data will be representative of these counties and no claims of statistical significance beyond this delimit will be made. Notwithstanding this, the structure of agriculture in these areas is arguably similar to that in other parts of Ireland, the rest of the Western region in particular, though behavioural characteristics may be considerably different. Though the number of sampling errors tends to rise with relatively small samples, there are ways of reducing sampling errors. One possibility is to increase the sample size by increasing the number of days per person, or number of persons per household. Application of systematic stratified sampling methods may also keep sampling errors within limits. Not infrequently, the sample size needed to satisfy the precision levels for all key estimates is found to be larger than can be achieved with the resources available. In this case, the requirements are often cut back by dropping some members of the initial set of key estimates and/or lowering the specified precision levels.

4.2.3 Choosing a Survey Approach

There are several approaches through which time use surveys can be administered: telephone interview, face-to-face personal interview, respondent self-reporting, drop-off and pick-up, or by mail. The method used to collect the data influences the quality and validity of the data, thus careful consideration of how the survey should be administered is paramount.

Although by no means the most common method used around the world, some countries and researchers have demonstrated that time use data can be collected by telephone. Researchers in Canada have successfully run a series of time use surveys in this manner, as have studies in the United States (Zuzanek, 2009). Telephone interviewing has been found to be a valid and cost-effective method of gathering time use information, but it has also been acknowledged that this form of data collection has certain undesirable implications such as non-coverage of some households, lower response rates than from interviewer-administered surveys, and some limitations in the data collected. Reduced cost is the single biggest advantage of telephone interviewing as travelling expenses do not have to be paid. Collecting data by telephone from a centralized calling centre also offers the opportunity to monitor interviews and improve the quality of the entire data collection process. For the purpose of this research, locating a

complete list of contact numbers for farm households in the relevant counties proved unsuccessful as no comprehensive list of telephone numbers for farm households in the relevant study area exists. Thus, telephone interviewing was disregarded as a possible survey approach.

Time use surveys can also be administered face-to-face by interviewers. While this method may increase response rates, the implication is that the diary cannot be filled out throughout the day but must refer to the previous day. In addition, interviewer administered surveys are very labour intensive and are therefore much more expensive than collecting the data through self-completion postal surveys, as interviewers may not be able to target the desired household members without many call backs. Time concerns may also be an important impediment to face-to-face interviews, because the interviewer may ask for co-operation at an awkward moment or because the respondent may feel that the interview will take too much time. This is particularly true when compared to self-completion surveys in which respondents can answer the questionnaire in their own time, permitting leisurely and thoughtful reply. Response errors are also prevalent in time use data collected through personal interviews. According to Sudman and Bradburn (1974), interviews are a form of social interaction during which respondents have a tendency to behave according to social norms and values. Respondents may try to control the image they project of themselves to the interviewer by denying socially undesirable traits and admitting desirable ones, leading to response errors and under or over estimation in results (Phillips, 1971; 1973; Sudman and Bradburn, 1974; Niemi, 1993).

More often than not, time use diary surveys are self-administered whereby respondents are given a copy of a diary and asked to complete it several times over the course of the diary day or days. One advantage of this approach is that the information should be more accurate, since respondents fill in the activities as the day progresses, lessening the problem of recall. Another advantage is that it is less personally intrusive than being asked to talk about personal activities. There are a number of approaches when it comes to the distribution of self-administered surveys: drop-off and pick-up, postal or a mixture of both. People in industry and academic researchers favour the postal method as a means of dispensing surveys for reasons of expediency, since data can be procured more quickly, more abundantly, and more cheaply than when a personal interviewer is employed (Kanuk and Berenson, 1975).

Postal surveys are free from interviewer bias and variability and their relative or promised anonymity encourages respondents to respond more freely to private or socially undesirable information (Boyd and Westfall, 1955; 1965; Knudsen *et al.*, 1967; Boyd and Westfall, 1970; Case, 1971; Wiseman, 1972). The major disadvantage of postal surveys are their relatively low response rates due to the demands placed on the respondent (Lingsom, 1979)[17]. Due to their relatively low cost, geographical flexibility and ease of reaching respondents in remote areas such as farm households, self-administered postal surveys were considered the most suitable for this study. The survey instruments were mailed out and completed diaries were returned by mail.

4.2.4 Continuous Recording versus Fixed Time Intervals

A very important choice in the survey design process concerns that between continuous recording and fixed time intervals. Continuous recording allows the respondent to determine freely the time when one activity ends and another begins, whereas fixed time intervals require the respondent to record what activity was occurring at specific intervals throughout the day. Diaries with fixed time points are less burdensome on the respondent and they produce less variation in the recorded data, making data processing less demanding than that of continuous recording. There is mixed opinion on the merits of each technique. Niemi (1983) suggests little difference between the two approaches while Lingsom (1979) found that fixed intervals are best suited for use in self administered diaries. Most studies in Europe have opted for fixed-interval diaries using 10 or 15 minute episodes for recording activities (ESRI, 2005; Short, 2006; Eurostat, 2008). Time intervals can vary between 5, 10, 15, or 30 minutes. Intervals that are too long (greater than 30 minutes), while less cumbersome due to a more condensed diary, can result in activities that are of a short duration going unrecorded. Thus, a mid-point of 15 minutes is generally used.

During the small scale pilot survey (September-October 2010)[18], diaries using 15 and 30 minute intervals were administered. Surprisingly, the results revealed that the response rate

[17] However there are a number of ways, outlined in detail in the subsequent sections, by which this problem can be minimized.
[18] See Section 4.4 for details.

for surveys with 15 minute episodes was marginally larger. One possible explanation is that respondents less difficulty completing the diary with 15 minute episodes as many activities of shorter duration can occur in a fifteen minute time period. If two or more activities occurred during the 30 minute interval the respondent may have found it difficult to decide which one to include in the diary and refrained from completing and returning it. It was also found that fewer activities, on average, were recorded in diaries with 30 minute episodes, affirming the theory that shorter activities, regardless of calibre, failed to be recorded when the intervals are of a longer length. Consequently, 15 minutes intervals were deemed optimal for the time use diary in this research.

4.2.5 Open-ended versus Pre-coded Activities

There are two main types of time use diary, 'heavy' and 'light', each with their own set of strengths and weaknesses. The heavy or open ended diary requires the respondent to record their activities for each unit of time in terms of narratives which they choose themself. The wording or descriptions they use are later coded in accordance with an activity classification. Given the variety of skills and motivations of respondents', open-ended diaries allow diarists greater freedom to record those activities they deem important, some of which may be unusual or unpredictable. These unexpected activities may increase the researchers' awareness and understanding of the population under investigation and lead to more focussed follow up studies. Open-ended diaries are not without their weaknesses, for example, if an entry for a unit of time is noted with a phrase such as 'read the bible', the researcher may code the activity as either 'religion' or 'reading'. The choice of one or the other coding by the researcher may display partiality, as an interest or inclination in either religion or literature may influence the choice of the researcher.

The light or pre-coded activity diary contains a relatively short but comprehensive list of pre-coded activity categories from which the respondent is required to indicate which activity they were involved in for each episode of the day. One inherent weakness associated with this format is that the researcher can realistically include only a limited number of activity categories (usually no more than 35) into even the most streamlined diary (As, 1978; Gershuny, 1995). Another weakness is that pre-coded activities can also be ambiguous on the

part of the respondent, particularly if they feel their activity does not fit any of the pre-coded activities specified in the survey or that it qualifies as two or more of the pre-coded activities. Using the same example as above, if the respondent is reading the bible and attempts to categorise this in the time use diary using the pre-coded categories, they may feel it could be either 'religion' or 'reading' or both. One way of overcoming this problem is to include an open ended activity code to which the respondent can allocate their time to. Nevertheless, pre-coded diaries are ideal for special purpose small scale surveys, because they allow the researcher to identify and capture specific types of activities such as leisure, household work, farm work or civic engagement (Lingsom, 1979; Harvey, 1990; Hirway and Jeyalakshmi, 2007). They also impose less respondent burden than open-ended diaries because they are relatively simple and quick to complete. For this and the other reasons outlined, a light or pre-coded activity diary was chosen for the purpose of this research.

4.2.6 Accounting for Secondary or Simultaneous Activities

Humans are multitasking beings. For example, an individual can be watching TV, taking notes and drinking a beer, all in the presence of a group of friends. In fact, it is speculated that individuals are continually combining more and more activities into the same period, particularly when one activity is entirely passive (e.g. travelling on public transport). For example, some studies have found that respondents spend as much as 3 to 4 hours per day doing more than one activity at a time with television viewing, reading and almost all radio listening occurring as a secondary activity to a main activity (International Research and Training Institute for the Advancement of Women, 1995; Stinson, 1999). These studies and others by Harvey and Spinney (2000) suggest that a forum whereby respondents are able to report activities that might have been performed in tandem with other activities should at least be provided.

The nature of the reported activities can impact on how multitasking is defined. Two or more activities can be undertaken simultaneously (i.e. in parallel) or can be reported within one time episode (i.e. sequentially), whereby respondents switch their focus between two or more activities within short spaces of time. Juster and Stafford (1991) claim that most reported multitasked activities are usually performed sequentially. They note that a person can only

focus on one activity at a time, so all reporting of simultaneous activity is actually a fine-grained sequence of activities that current methods of data collection are not sufficiently fine-grained enough to capture. Another category of simultaneous activities, 'on call' activities, is proposed by Pollak (1999). On call activities are simultaneous activities that usually require a lot of attention from the respondent, for example the care of another person, and so support only limited opportunities for undertaking secondary activities. In practical terms, it is not often possible, if at all, to differentiate between the three types of multitasking. This is because when respondents report only primary and secondary activities occurring within the same time slot, there is no way of ascertaining whether they are carrying out the activities sequentially or in parallel.

Recording secondary activities has practical advantages. Multitasking individuals generally have a hard time reporting what they do if they have to report only one activity. The respondents must either distort what is happening or ignore the instruction to record only a single activity. In addition, some activities, minding children for example, can be missed in the absence of a secondary option. Accordingly, for the purposes of this research the widest possible definition of multitasking is used and all secondary activities are recorded in the same time diary interval as the primary activity.

4.2.7 Tomorrow versus Yesterday Diaries

The most commonly used types of time use field instruments are 'yesterday' and 'tomorrow' diaries. Yesterday diaries are typically collected by personal or phone interview, while tomorrow diaries, after initial contact with the respondent, are mailed or left behind by interviewers ('leave behind diaries') for the respondent to complete now and then throughout the following day or set of days. With yesterday diaries, the interviewer asks respondents about the activities in which he or she engaged in the previous day. They demand a reasonable level of self-expression and discipline from the respondent as they require the respondent to recall and reconstruct recent events from the previous day. However, they are generally more standardised and somewhat easier to administer, control and edit than tomorrow diaries. Although yesterday diaries have been shown to yield more activities, research suggests that the difference in the number of activities does not justify the additional

cost of obtaining yesterday diaries (Szalai, 1972; Robinson, 1977; Juster, 1985b; Robinson, 1985b). Experience from various studies points to the 'yesterday' interview as the most practical approach. However, the potential undercount of activities and loss of detail in yesterday diaries leads many researchers to believe that data gathered in a tomorrow diary (i.e. one left behind for completion) is measurably better than the data gathered through recall of a day's activities (Juster, 1986). In line with this and the budgetary constraints, the tomorrow diary approach was deemed appropriate for this research.

More specifically, respondents were asked to fill in each diary 'now and then' throughout the diary day though it was noted from the pre-tests and the pilot survey that occasionally respondents completed the diaries a day or so after the diary day. Included at the end of each diary is a list of six questions relating to the diary day, one of which asks the respondent when they filled in the diary. They were given a list of four options from which to choose: now and then during the diary day; at the end of the diary day; the day after the diary day; and, at a later time. Those who reported that they filled the diary 'at a later time' were given the option to record how many days later they completed the diary. Studies on whether diaries completed for days further back than yesterday produce quality data yield mixed results (Klevmarken, 1982; Juster, 1985b). For example, Juster (1985b) found that there is very little, if any, quality deterioration with extended recall diaries for Friday-Sunday observations, but there is quality deterioration to the order of 10 percent or more for Monday-Thursday diaries. According to Harvey (1999), the general view of experienced time use researchers is that recall should not be attempted for more than two days in arrears. Mindful of this, diaries that were completed more than two days after the diary day were not included in the analysis.

4.2.8 Period of Time, Number of Days Covered and Random versus Convenient Days

Peoples' use of time is subject to wide seasonal variation. Especially in households where agriculture is the dominant activity, time use surveys conducted at different times of the year can be expected to lead to substantially different results (Hill and Juster, 1985; Wodon and Beegle, 2006). Ideally, a time use survey should reflect those differences by collecting data

across all four seasons. However, a view has been offered in the international arena that if time use data cannot be gathered over an entire year then autumn data collection is the next best alternative (Niemi, 1983). While some researchers have accepted this viewpoint, many activities in Ireland, particularly in relation to agriculture, leisure and recreational pursuits, are greatly determined by the weather and therefore the time of the year has a major impact on many people's use of time. With this in mind, and in line with the Eurostat (2008) guidelines, time use diaries were collected over a seventeen month period spanning from the beginning of April 2011 to the end of August 2012.

An issue of concern in diary studies is the number of days for which diaries should be requested of respondents. The number of days covered per person can affect the quality of the data as activities vary across days, though with some degree of cyclicity within single weeks. Many activities (e.g. volunteering) are undertaken regularly but not daily, so diaries with shorter (e.g. one day) recording periods will show zero-totals for many activities; the longer the recording period the fewer of these zero-totals, and the lower the standard errors of the estimates of mean times in the activities. However, longer seven day diary studies (as collected in the Netherlands and the UK), while beneficial, impose compensating costs such as inaccurate data and lower completion and response rates. Erroneous data can be due to memory lapse associated with the diary being collected on a yesterday recall basis, while low completion and response rates can be a result of respondent burden and fatigue associated with longer diaries. There appears to be no a priori case for an optimum number of days, though the recommendation from the Eurostat guidelines (2008) is the use of two days for each respondent i.e. one weekday (Monday to Friday) and one weekend day (Saturday and Sunday). Accordingly, the time frame used in this thesis is two days, one a weekday and the other a weekend day.

If respondents are completing time diaries for only one or two days out of seven, it is important to achieve across the entire sample an even representation of the days of the week. This raises the issue of the relative advantages and disadvantages of designated versus convenience day surveys. The actual days may be chosen by random selection or chosen at the convenience of the researcher or respondent. There is no strong argument for either approach, though it is preferable to use a designated day approach in order to reliably capture the several dimensions of behaviour. The concept of designated days was outlined to the

members of a focus group while designated diary days were used in the pre-tests and small scale pilot survey. The focus group consisted of a range of ten farm operators and other farm household members. Each member of the focus group was given a survey instrument including a diary and encouraged to read and discuss it. After extensive discussion, members of the focus group were asked to comment on various aspects of the survey. The focus group and respondents of the pre-tests asserted that, if they forgot to complete the diary on the designated day, or the designated day was unusual or particularly busy for them, they were unlikely to complete the survey and return it. They suggested that if a random day of the week was designated but that day could fall on any week within a four week period, the respondent would have four chances to complete the diary, and thus respondent burden would be somewhat alleviated and the likelihood of a response would increase. Though this method may produce a systematically biased sample, Lyberg (1989) pointed out that there was little difference in diaries collected on the designated day and those delayed to the same day the following week or so. Consequently, a combination of the two methods, designated and convenience day sampling was used in the final survey. In line with this, the diary days were distributed across the days of the week, with 20 percent allocated to each of the weekdays Monday through Friday and 50 percent of weekend days to Saturdays and 50 percent to Sundays.

For the purpose of analysis in the furute, two independent household level weights, a weekday and a weekend day weight, may be used to account for the compositional and distributional characteristics of the set of farm households (and their characteristics) which participated in the usable weekday and weekend day diaries. The data recorded in the survey may also be re-weighted or statistically adjusted in line with farm household parameters from the NFS or the Irish Census of Agriculture to bring the data in line with nationally representative farm level data. The purpose of weighting is to compensate for any biases in the distribution of characteristics in the completed survey as compared to the population of interest. As noted in Section 3.5, such biases may occur because of sampling error, from the nature of the sampling frame or as a result of differential non-response rates between different sub-groups of the population.

4.2.9 Context

Context in time use diaries usually refers to the location where the activity took place (where), the presence of other people when the activity took place (with whom), the beneficiary, person, or institution of the activity (for whom the activity was carried out), the motivation of the activity (for example, whether the activity was paid or unpaid), etc. Robinson (1999b) and Harvey and Royal (2000) note that a description of an activity in not completely meaningful unless, at the very least, reference is given to possible other people present (with whom) and to where the activity took place (where). The inclusion of context variables to further describe an activity is closely related to the analytical objectives of the data collection and serves several purposes. First, context provides meaning to activities and groups of activities. Second, in itself, context is meaningful and third, context aids recall and hence helps increase accuracy in responding. Despite being very useful to the researcher, the amount of contextual data collected is limited to the capacity and willingness of respondents to provide quality information. Robinson (1999b) and Lingsom (1979) warned that asking more than two or three questions per activity might lead to burdensome reporting tasks and affect the quality of respondent reporting. Eurostat guidelines recommend that a 'with whom' and 'location' categories be included in the diary. Accordingly, for the purpose of this research, it was deemed appropriate to include 'with whom' and 'location' categories in the diary. In the pre-testing and pilot surveys, respondents were given a selection of three alternative 'with whom' codes to choose from: no-one/I was alone; household member; and others and multiple (non-household members or household & non-household members mixed). Respondents were also given four locational codes from which to choose when recording where each activity took place: at home; community; travel; and work/study. Drawing on the feedback from the focus group and the pre-testing, changes were made to the phrasing of the codes in each category and two of the codes in the 'location' category were integrated into one called other (work, study, travel, etc.).

4.2.10 Activity Classification

In a time use survey, the activity is the basic unit of analysis. Thus, regardless of the system adopted, the nomenclature and classification of activities form an important part of the

planning, collection and analysis of time use data. For the purpose of this research, the diary is pre-coded i.e. respondents are given a ready made list of coded activities from which to pick the activity they believe corresponds to the activity they are doing. It is therefore imperative that careful consideration is given to the number and classification of the coded activities as they are important indicators of the type and quality of data available for analysis. It is argued that the data collected should be relatively disaggregated, as a larger number of categories gives more finely tuned information about activities, though a system of too many categories can overwhelm respondents (Harvey and MacDonald, 1976).

Internationally, several coding schemes exist, many of which have evolved from the original structure developed by Alexander Szalai (1972) for the Multinational Time-Use Project of the 1960's e.g. the Eurostat classification system, the Australian classification system and the United Nations international trial classification system. Stinson (1999) discerned that these coding schemes share many similarities and are typically arranged into mutually exclusive behaviour or activity groups that cover all aspects of human activity. They generally include: 1) personal care activities; 2) travel; 3) employment related activities; 4) education activities; 5) domestic activities; 6) purchasing goods and services; 7) child care activities; 8) voluntary work and care activities; 9) social and community activities; and, 10) recreation and leisure time. These activity groups were employed for the purpose of the time use diary in this thesis. Additionally, to accommodate and reflect farm-related activities unique to the local environment in the West of Ireland, a farm related activity group was also included. Initially there were four activity codes in this group: planting and harvesting; farming of animals; administration; and non-paid activities related to farming. This list was compiled from information collected during the focus group. However, the cognitive tests showed that there was no activity included in the diary which covered the various types of farm maintenance that farm household members engage in. Subsequently, an activity code for farm maintenance such as fencing, building walls, felling trees and maintenance of machinery was also included.

The remainder of the activity codes (thirty in total) are loosely based on the 1-digit Eurostat activity classification (Eurostat, 2008) and the coding scheme used in the Time Use in Ireland

2005 survey[19] (McGinnity *et al.*, 2005). Also included is an open ended activity code which allows the respondent to include any activity that was omitted from the list. As specified in Chapter 1, one of the main aims of this thesis is to examine off-farm non-market related activities, with an emphasis on informal voluntary and civic engagement activities. The distinction is therefore made between the alternative uses of non-market time (i.e. unpaid work, leisure and personal care) based on the third-party principle proposed by Hill (1979). Unpaid work is comprised of activities for which one could pay a third party to perform e.g. farm related activities. The activity group housework and other household tasks also falls into this category and is divided into three activity codes: cooking, housework and other domestic work. Shopping and errands are a distinct activity group as some types of shopping (e.g. clothes shopping) can be classified as enjoyable activities and are therefore akin to leisure. Caring for others is included as a separate activity group and includes two activity codes, one for childcare and one for caring for others. Childcare is in a separate activity group to housework since, unlike home production, childcare has an investment component and is likely to be more enjoyable than housework (Connelly and Kimmel, 2010). Caring for adults consists of caring for those who are either household members or reside in another household.

Leisure comprises of activities that one cannot pay someone else to do, as utility is derived directly from the experience of doing the activity. Five activity groups can be classified as leisure: voluntary activities; religious activities; socialising, communicating and going out; sports and exercise; and TV and radio. For the purpose of this study, the voluntary activity group codes in the Eurostat classification were disaggregated to reflect in more detail the formal, and more importantly, informal civic engagement that people engage in. Religious activity includes attending religious ceremonies or prayers, etc. Spending time chatting with family and friends, phoning or texting family and friends, and eating out or going out are the three activity codes included in the socialising, communicating and going out activity group. Five activity codes are included in the sports, exercise and leisure activity group: playing sports and physical exercise; productive exercise such as fishing or hunting; attending sports related activities; using the computer or internet; and other hobbies and leisure pursuits. TV and radio is disaggregated into two activity codes: watching TV or listening to the radio and reading.

[19] This was undertaken in order to facilitate a comparison with the ESRI dataset.

Personal care comprises sleeping, resting, washing, eating and other activities related to satisfying personal needs. Like leisure, one cannot pay a third party to do these activities but, unlike leisure, doing at least some of these activities is necessary for survival. The travel activity code includes travel entailed in market and non-market productive activities, care of children, the sick and the elderly, shopping, education and related activities, social and other activities, as well as personal care. The paid employment or study activity group includes three activity codes, one each for paid employment, study and education and for breaks from work or study. Also included is an open ended activity code which allows the respondent to include any activity that was omitted from the list.

Overall, few respondents reported activities not covered by the list. The activity code system was further revised and modified on the basis of the results of the pre-testing and piloting of the original draft of the survey. For example, the font size of the activities in the diary was increased, more detail was included for some activities and the main activity for each activity code was highlighted with capital letters and bold font. One final adjustment was made in the final diary, the ‘location’ category and the row where the respondent records their location for each episode were shaded grey, while the ‘with whom’ activity codes and corresponding rows were shaded a darker grey. The final and complete list of activity codes is outlined in Table 4-2.

Table 4-2 Complete list of Activity Classification Codes

A. Activity Group	Activity Code		Activity Code
Personal Care/Resting	**1**	**SLEEPING/RESTING**, relaxing, doing nothing, time out, thinking, **PERSONAL CARE**, washing, dressing, bathroom, **EATING/DRINKING**, having a meal	**1**
Travel	**2**	**TRAVEL** including travel to and from work as well as free time and domestic travel e.g. dropping kids to school, driving to the shop, etc.	**2**
Paid Employment or Study	**3**	**PAID EMPLOYMENT** excluding farming, include paid and unpaid overtime, work from home, self-employment. Exclude lunch and other breaks	**3**
	4	**STUDY, EDUCATION** include farm courses, night classes, studying at home. Exclude lunch and other breaks	**4**
	5	**BREAKS from WORK or STUDY** include tea/coffee, smoking and lunch breaks	**5**
Farm Related Activities	**6**	**PLANTING, HARVESTING, PICKING and WEEDING**, preparing land,	**6**
	7	**FARMING OF ANIMALS**, tending, breeding, feeding, dosing, sheering, etc.	**7**
	8	**FARM MAINTENANCE** fencing, building walls, maintenance of machinery, construction or repairs to infrastructure, felling of trees, etc.	**8**
	9	**ADMINISTRATION**, filling in forms e.g. single farm payment scheme, REPS, veterinary medicine forms, farm accounts, etc.	**9**
	10	**NON-PAID ACTIVITIES RELATED TO FARMING** e.g. attending Macra na Feirme, ICMSA or IFA meetings etc.	**10**
Housework and Other Household Tasks	**11**	**COOKING** & food preparation, making lunches, washing up, making tea, etc.	**11**
	12	**HOUSEWORK** include laundry, cleaning, ironing, hoovering, tidying up, changing beds, etc.	**12**
	13	**OTHER DOMESTIC WORK** include house repair and maintenance, DIY, odd jobs, lawn and garden care, vehicle maintenance, saving turf, pet care, etc.	**13**
Shopping & Appointments	**14**	**SHOPPING, ERRANDS & APPOINTMENTS**, shopping for food or leisure, using services e.g. going to the hairdressers, doctor, paying bills, etc.	**14**
Caring for Others	**15**	**CHILDCARE**, looking after children, playing & talking, physical care, supervision, reading, helping with homework, etc.	**15**
	16	**CARING FOR ADULTS** with special needs or elderly persons, in your home or elsewhere e.g. help with personal care or getting in or out of bed	**16**
Voluntary	**17**	**CIVIC ACTIVITIES**, voluntary/organisational work, dealing with the Gardaí, political/community/trade union meetings, organising sports/coaching, filling surveys, providing meals, scouts/youth clubs, etc.	**17**
	18	**INFORMAL HELP TO OTHER HOUSEHOLDS**, construction & repairs as help, help with farming activities & other unspecified informal help	**18**
Religious Activities	**19**	**RELIGIOUS ACTIVITY**, attending religious services, prayer, etc.	**19**
Socialising, Communicating and Going Out	**20**	**SPENDING TIME or CHATTING with FAMILY, FRIENDS or NEIGHBOURS**, visiting friends or family in their homes, eating in a colleague's, relative's or friend's house, entertaining at home, etc.	**20**
	21	**PHONING/TEXTING FAMILY, FRIENDS or NEIGHBOURS** include writing an e-mail/letter & using social network sites e.g. Facebook, Twitter, etc.	**21**
	22	**EATING OUT or GOING OUT** include going to cafes, bars, restaurants, nightclubs, concerts, theatre, cinema, galleries, bookies, bingo, library, etc.	**22**
Sports, Exercise and Leisure	**23**	**PLAYING SPORTS, PHYSICAL EXERCISE** including playing football, walking, jogging, cycling, golfing, horse riding, water sports, walking the dog, etc.	**23**
	24	**PRODUCTIVE EXERCISE** such as hunting, fishing, picking berries, mushrooms, herbs, etc.	**24**
	25	**ATTENDING SPORTS RELATED ACTIVITIES**, spectating, going to rugby, football, hurling, soccer matches, etc.	**25**
	26	**COMPUTER/INTERNET FOR PERSONAL USE** e.g. games consoles, play station, surfing the net, using the computer for leisure, shopping, etc.	**26**
	27	**HOBBIES and OTHER LEISURE ACTIVITIES** e.g. playing musical instruments, playing cards, arts, other games, etc.	**27**
TV and Radio	**28**	**WATCHING TV** and videos/DVDs or **LISTENING** to the radio, records or cds, etc.	**28**
	29	**READING** a book, magazine, newspaper or letter, etc.	**29**
Other	**30**	**OTHER** please specify	**30**
B. Who You Were With?	**31**	**No-one**/ I was alone	**31**
	32	**Household members/ partner of children**	**32**
	33	**Household members &/or other persons I know**	**33**
C. Where You Were	**34**	**At home** (including on the farm)	**34**
	35	**Community** (social or recreational clubs, church, friends house, etc.)	**35**
	36	**Other** (work, study, travel, etc.)	**36**

4.2.11 Response Rates

Recent decades have seen an increase in non-response rates of household surveys (Curtin *et al.*, 2000; De Leeuw and de Heer, 2002; Groves *et al.*, 2006), particularly in household surveys that cover a fixed time period such as travel surveys, household budget surveys, or, in the case of this research, time use surveys. Response rates for postal surveys can range from 2.5% to 97.7%, as found by Larson (2005) in a review of published research using postal surveys. The survey in this research is both a household and a postal questionnaire, accounting for its relatively high non-response rate of 89% (see Section 5.3.1). It is hypothesised that high non-response rates for time use surveys will introduce bias into the findings since the characteristics that result in people not responding (such as being busy) reflect aspects of how those particular people spend their time (Groves and Heeringa, 2006). However, case studies have shown that there is little relationship between non-response rates and non-response bias (Curtin *et al.*, 2000; Keeter *et al.*, 2000; Merkle and Edelman, 2002). It may be that busy people are interested in keeping track of their time use (as it records their status of being important), whereas leisurely people may be reluctant to report few or low-status activities. Moreover, Zuzanek (1998) and Van Ingen *et al.* (2009) suggest that those who are most busy are those who can handle the most obligations at the same time, including the extra effort of a survey and are therefore equally likely to respond to time-diary questionnaires. In fact, there is little evidence that busy people refuse to keep a time diary more often than non-busy people (Goyder, 1987; Robinson and Godbey, 1997; Robinson, 1999a; Abraham *et al.*, 2006). Further to this, research by Groves *et al.* (2006) shows that although non-response bias is common, the non-response rate by itself does not predict well the amount of non-response bias.

The most commonly recommended protection against non-response bias has been the reduction of non-response itself. Achieving low non-response rates however is one of the most difficult objectives in the design of time use surveys, as some of the solutions are relatively costly. There is strong evidence that light diaries, preliminary notification, sponsorship, stamped reply envelopes, follow-up visits and phone calls, small monetary and non-monetary incentives are very effective or have positive affects on increasing response rates (Kanuk and Berenson, 1975; Linsky, 1975; Yammarino *et al.*, 1991). In line with this, it was felt that some consideration be paid to each as a means of encouraging participation. As

previously affirmed, a light diary (pre-coded activities) design was chosen. Harrison (2010) notes that questionnaires mailed as part of a package pique respondent interest, addresses respondent concern, and most importantly encourages response. In keeping with this theory, a package including a cover letter, two booklets containing diaries and individual questionnaires (for two people), a household questionnaire, and a stamped return envelope was mailed to each household in the sample.

An advance or pre-notification letter introducing the research, outlining its purpose and significance and inviting cooperation was sent to each of the random sample of households a week prior to the survey[20]. Respondents were asked to contact the researcher if they did not wish to receive the time use survey. Sixty-nine households phoned, e-mailed or texted to express their refusal to participate, citing reasons such as poor eye sight, illiteracy, the death of the farm operator and/or illness. As noted already, a cover letter, making reference to the pre-notification letter, emphasizing the legitimacy and worthiness of the study, as well as the importance of respondent cooperation, was included in the mailing package. Groves *et al.* (2000) leverage-salience theory posits that survey introductions and survey materials emphasizing the research topic risk stimulating participation among persons whose self-interests can be served by responding and depressing participation among those who perceive no such interest. In addressing this issue, the focus of this thesis, voluntary, civic engagement and leisure activities, was made less salient in the pre-notification and cover letters. Respondents who completed the survey were offered an incentive in the form of entry into a draw for four prizes, serving to heighten the extrinsic benefits of participation to those uninterested in the survey topic itself.

In addition, the most prominent farming organisations in the West of Ireland, namely Teagasc, the Irish Farmers Association (IFA), the Irish Cattle and Sheep Association (ICSA) and the Irish Creamery and Milk Suppliers Association (ICMSA), were notified of the study and kindly agreed to support the research by permitting the use of their official logos and the indication of their endorsement on all survey correspondence with respondents. Stamped addressed reply envelopes were included with each survey in an attempt to decrease

[20] A copy of the pre-notification letter introducing the research and outlining its purpose is included in Appendix C.

respondent burden and encourage participation while a monetary incentive in the form of entry into a prize draw was also offered to incentivise respondents. There were four prizes of fuel vouchers ranging from €50 to €200. Overall, some incentive, either in the form of a token gift or entry in a larger draw, seems to be necessary in view of the level of burden on the respondents.

4.2.12 Summary

This section has outlined the options that were considered with regard to the design of the time use diary. The diary, for the purpose of this research, focuses on the farm household, in particular the farm operator and one other household member, usually the spouse/partner, parent, sibling of adult child of the farm operator. The self-administered 'tomorrow' diary is administered by means of the postal method. The three major decisions concerning the design of the diary, the choice of pre-coded versus open-ended categories, the choice of fixed time versus open intervals and the activity classification were discussed in depth. Pre-coded fixed time intervals of 15 minutes were chosen with a list of thirty activity codes assembled following consultation with a focus group, pre-testing and pilot testing. Secondary activities and contextual data is also collected for each individual.

4.3 Individual and Household Questionnaires

While the time diary is the main instrument of time use surveys, additional information is often needed that is as critical to the interpretation and analysis of time use as that already contained in the diary. This supplementary information might include basic personal and socio-economic data on the individual, such as age, gender, marital status, child status, education or labour force status, and characteristics of the household such as size, location or farm size and system. Thus, time use surveys typically require the administration of a personal or individual questionnaire and a household questionnaire in addition to the time diary. The individual and household questionnaire also make it possible to acquire further information on average weekly time use in market or farm work and activities that are performed infrequently that may be of interest to the research, but may not have been picked up in the diary. Many of the questions were structured to match questions in the 2002 Survey

of Social Capital (NESF, 2003), the 2002 County Galway Rural Resource Study (Frawley *et al.*, 2005), the 2005 Time Use in Ireland Survey (ESRI, 2005), the 2006 Survey of Civic Engagement (Taskforce on Active Citizenship, 2007), the 2007 Farm Structure Survey (CSO, 2008; Eurostat, 2009), the 2010 Census of Irish Agriculture (CSO, 2012a), the Farm Management Survey 2007/08 (Kramm *et al.*, 2008), the 2009 Challenges, Changes and Opportunities in the Irish Uplands Research Project Survey of Farmers/Landowners (The Irish Uplands Forum, 2009), and the Census of Population 2006 and 2011 (CSO, 2006; 2012b), to allow comparisons between the data collected for the West of Ireland and state and national averages. What follows in this section is an overview of the survey questions and the motivation behind the inclusion of each question. The questionnaire, in its entirety, is included in Appendix B.

4.3.1 Individual Questionnaire

One of the main objectives of this research is to identify the determinants of the decision of farm household members to participate and the level of participation in non-market activities. The activities in which the respondent partakes are identified in the time use diary. Therefore, this section of the survey, the individual questionnaire, serves to collect supplementary data on the individual including socioeconomic data, subsequently used in the analysis of the determinants of participation and level of participation. It should be noted that one of the main concerns of additional questionnaires is the potential of the quality of the time use data being affected by possible respondent fatigue. For this reason, the individual questionnaire is located at the end of the two diaries and is therefore completed last. With regard to the structure of the individual questionnaire, Dillman *et al.* (2008) points out that questions should be ordered in a way that will be logical to the respondent. Bearing this in mind, the questionnaire flows through four major categories of questions: personal and socio-economic variables; time spent doing on-farm and off-farm work; community, voluntary and civic engagement; and social capital. The following subsections outline the questions in each of the four major categories and the justification for their inclusion.

4.3.1.1 Personal and Socioeconomic Variables

Question 1 - 2: Careful consideration was given to the first question as Dillman *et al.* (2008) noted that the first question should be easy to answer and apply to all respondents. Consequently, the first question in the individual questionnaire establishes the gender of the respondent. This information is used to determine the role, if any, that gender plays in the participation and level of participation in various activities. The next question, "Are you the main farm operator?", is a filter question and ascertains the role of the respondent on the farm. If the respondent identified themselves as the main farm operator, they were asked if they considered themself a full or a part-time farm operator. This permits one to analyse if the farm operators' perception of the number of hours spent farming and the actual hours they spend farming are consistent with the definition of a full-time and part-time farm operator as defined in the NFS (NFS)[21].

Question 3 - 5: These questions relate to the age, marital status and the presence and number of children of the respondent. This establishes the basic household and family structure as age and marital status are essential to establish the life-cycle position of the family and demographic viability. As noted previously, the presence and number of children in a household is a contributory factor of a person's decision to participate in community and voluntary work.

Question 6 - 7: The highest level and number of years of education is determined in these questions. The relationship between education and voluntary activities has been well established in the literature.

Question 8: It is also established if the respondent has completed a farm apprenticeship or any part or full-time course on farming or related subjects. This question is consistent with a question in the Farm Structure Survey (CSO, 2007; 2008) and the Census of Irish Agriculture (CSO, 2012a), and provides scope for comparative analysis.

[21] Full-time farms are defined as farms which require at least 0.75 standard labour unit to operate, as calculated on a Standard Mean Day (SMD), whilst part-time farms require less than 0.75 labour units (Teagasc, 2012).

4.3.1.2 Time Spent on On-farm and Off-Farm Work

Question 9 - 10: The uptake of off-farm employment, the most usual path taken in most areas to supplement farm incomes by the respondent, is established. It is assumed, a priori, that people with off farm employment who also contribute time to farm related activities may have less free time and therefore are less likely to participate in civic engagement. Question 9 establishes the respondent's situation regarding employment. Question 10 is a filter question. If the respondent has an off-farm job, they are asked to report what their occupation is and how many hours per week they normally work in their off-farm job. This question is consistent with a question in the 2005 Time Use in Ireland survey.

Question 11: A multiple choice question, question 11 offers the respondent a list of six options from which to choose the average number of hours they spend on farm work per week. This question matches a question in the Census of Agriculture (CSO, 2012a) and allows cross comparison of local and national averages.

4.3.1.3 Community, Voluntary and Civic Engagement Activities

Question 12 - 13: One way of gauging the level of community engagement is by asking questions relating to participation in local voluntary activities. This was measured by two questions. The first asked respondents if they take part in any type of unpaid voluntary activity or service on a regular basis and the second asked the respondent if they had been actively involved in any type of voluntary or community group in the past twelve months.

Question 13 is another filter question. Those who answered yes to volunteering in the previous twelve months were asked to name what they felt were the three most important voluntary or community organisations in which they were actively involved. These questions enable one to analyse the determinants of volunteering and community engagement and the level of community involvement. The data from these questions is directly comparable with the data from the 2002 Survey of Social Capital in Ireland (NESF, 2003) and the 2006 ESRI Survey of Civic Engagement (Taskforce on Active Citizenship, 2007).

Question 14: One way of measuring active citizenship is to ask people about the extent to which they are involved in political or local community action around a variety of issues and problems in the community. This was done by asking respondents if, in the past 12 months, they had partaken in any of a list of seven activities listed, such as joining an action group or contacting a public representative. Civic engagement was then measured as participation in at least one of the seven possible areas of activity within the previous 12 months. This question is similar to one in the 2002 Survey of Social Capital in Ireland and the 2006 ESRI Survey of Civic Engagement, making the comparison of active citizenship between farm household members and State averages possible.

Question 15 - 16: These questions give the respondent the opportunity to note how many organisations or clubs they are members of or associated with. It presents a list of the most common activities and associations in the survey county (compiled from a collation of information from pre-testing) which they may be a member of or affiliated with. It asks the respondent to give an indication of how often they have attended meetings or been affiliated with the organisation in any way over the previous twelve month period.

Question 17: This ascertains if the respondent has ever been part of a project to organise a new service in their area. This question is important because it gives the researcher the opportunity to capture if an individual was at any time socially engaged, as it may be the case that an individual was extremely pro-active in the community in the past, though at the time of the survey the respondent may be incapacitated or housebound and no longer able to participate in community activities.

4.3.1.4 Health, Quality of Life and Life Satisfaction

Question 18: Camporese *et al.* (1998) note that in order to accurately evaluate quality of life within the time use survey framework, the organisation of daily time use should be linked in some way to levels of satisfaction with various aspects of daily life. Thus, this section uses a subjective health and quality of life measure for the analysis of well-being. Self-rated health was assessed by the standard question "In general, how good would you say your health is?". Responses of 'very good', 'good', 'fair', 'poor' and 'very poor' were coded 1 to 5

respectively. Self-rated quality of life was measured in a similar way. Based on a question from the World Health Organisation's Quality of Life Survey (WHO-QOL, 1998), which has been used in several population studies (Kelleher *et al.*, 2003; Morgan *et al.*, 2008), respondents were asked to rate their quality of life on a 5-point likert scale[22] from 'very good' (1) to 'very poor' (5). While more sophisticated measures are available, this measure is used because it is widely used in survey research and has been shown to be a useful indicator of health status and risk of mortality. The general self assessed health status question is also comparable to question 18 in Ireland's Census of Population 2011 (CSO, 2012b), permitting comparative analysis between how farm household members view their health and how the general population view their health.

Question 19: A more general measure of the quality of life is overall life satisfaction. This question asks the respondent to report how satisfied they are with their present situation in various areas of their life e.g. work or daily activity, financial situation and life in general. Respondents were asked to mark their response on a likert scale of 1 to 6, with 1 being 'not satisfied at all' and 6 being 'fully satisfied'. This question is comparable with a question in the 2005 Time Use in Ireland Survey (ESRI, 2005).

4.3.1.5 Informal Social Support Networks/Social Capital

As previously established, one of the objectives of this thesis is to explore the relationship between social capital, fostered through strong social ties or links with one's rural community, self-rated health and quality of life. Three broad dimensions were deemed important in attempting to measure social capital in social networks, namely: informal social ties (and norms) of obligation, trust and faith in other people; community (including voluntary and civic) involvement; and, social contact and communication with others, including neighbours.

[22] A likert scale is a scale commonly used in questionnaires. It is an ordered, one-dimensional scale from which respondents choose one option that best aligns with their view. Typically a range of questions using response categories such as strongly agree, agree, disagree and strongly disagree are utilised to construct a composite measure.

Questions 12 - 17 generate information relating to community involvement and active participation. Data pertaining to the other two dimensions was generated from the following questions. Many of the questions in this section are identical to those in the 2002 Survey of Social Capital and the 2007 Survey of Civic Engagement permitting cross comparison of the data.

Question 20 - 21: These two questions relate to contact with others or informal sociability and determine if the respondent has visited anyone in their home or if anyone has visited them in their home in the four weeks prior to completing the survey.

Question 22: Informal social support networks including availability of help in the form of advice, service or voluntary time from friends or neighbours can be important for various personal reasons including job search, health and well-being, though they are difficult to measure. Asking the respondent if they can get help from friends when they need it is used to gauge if the informal social support networks are readily available to the respondent.

Question 23 - 25: The concept of social exclusion or social isolation has been brought to the fore as a social indicator for quality of life. These questions offer several measures of attachment and participation in society and therefore act as a tool for measuring the quality of life of the respondent and for identifying the presence of social capital.

Question 26 - 27: Typically 'trust' is used in the literature as a proxy measure of social capital. Thus, following Leyden (2003), a measure of the general level of trust that the respondent has in society is generated by constructing an index from the answers to these two questions. Question 26 begins with a statement "Generally speaking, would you say that in your area", the answers being scored as follows: (0) you can never be too careful, (1) don't know, and (2) most people can be trusted. Asked if they felt the area in which they live is a safe place, respondents answers were scored as follows: (0) no and (1) yes. Scores on this index range from 0 which reflects a complete lack of trust and faith in others to 3 which shows that respondents feel that people can be trusted, are fair and are helpful.

4.3.1.6 Open Ended Question

At the end of the individual questionnaire, the end of the diary booklet, a general open-ended question was included. Respondents were invited to write down their thoughts and reflections on their own time use, well-being and contribution to community life. It was expected, a priori, that respondents would not have much to say at this stage, though many respondents were forthcoming with information.

4.3.2 Household Questionnaire

In the household questionnaire, the focus is on the household and the farm rather than the individual. It was designed to get an overview of structure of the household and to get a picture of the current farming operation. By definition, a household is "a single person or group of people who regularly reside together in the same accommodation and who share the same catering arrangements" (CSO, 2012a), and thus the farm household includes individuals who:

1. Live under the same roof or within the same complex or homestead;
2. When they are together, share food from a common source at least once a day (i.e. they cook and eat together); and,
3. Contribute to or share in a common resource pool (i.e. they contribute to the household through wages and salaries, or other cash and in-kind income; or they benefit from this income but do not contribute to it e.g. children and other non-economically active members of the household).

This definition is broad enough to include the farm operator, their spouse/partner, parent or parents, children, siblings, household members who are in prison or hospital, or away studying, and those who consider themselves members of the household but are away temporarily for another reason. Data on the number of people living in the household, the age profile of household members, length of time the family has lived in the area and the location of the farm in relation to more urban centres etc. was obtained.

4.3.2.1 Structure of the Household

Question 1 - 2: establish the basic household and family structure. The number of people in the household and the age of the household members are essential to establish the life-cycle position of the family and demographic viability. The age profile of household members is important as younger or older people tend to be more dependent and require the commitment of more time from the farm operator and other spouse or partner.

4.3.2.2 Rootedness

Question 3 - 4: These questions relate to the embeddedness of the family in the area in which they live. One would assume that the longer a family resides and farms in an area, the more secure they may feel and the more integrated into the community they are. These questions are similar to questions asked in the 2002 County Galway Rural Development Survey (Frawley *et al.*, 2005).

Question 5 - 6: These questions record the distance the household is from the nearest village, town or urban centre and the size of the community (parish or village) with which the household is associated. One expects that the further away from a town or urban centre the household is, the less likely the household members are to participate in voluntary or civic related activities.

4.3.2.3 Farm Profile

This section details the farm and the current farming operation. The size and the predominant farming system are ascertained as these factors will almost certainly impact the use of time of the farm operator and their spouse or partner. For example, dairy farming may be considered a more labour, and thus time intensive, system as cows have to be milked twice daily and may not permit the operator as much free time as a specialist beef farmer might have.

Question 7: This chronicles the size of the agricultural land used for farming, known as the UAA. Areas taken up by roads, tracks, water, bog, marsh, rocks, unused rough grazing land,

buildings etc. are excluded. Commonage used by the farm is not included as part of the area farmed" (CSO, 2008, p.8). Respondents were given the option to answer the question in either hectares or acres as the cognitive tests revealed that some farm households were unable to report their agricultural holding in acres. All answers were later converted to hectares for analysis and comparative purposes. This question is included in almost all agriculture related surveys.

Question 8: To identify the types of farms under consideration, the respondent was asked to describe the predominant farming system. A list of the six main farming systems found in Ireland was included.

Question 9: It was deemed important to determine if casual workers are hired to work on the farm. It was thought that hired labour, as a substitute for farm household member labour, would mean that respondents to the survey could enjoy flexibility with regard their schedules and more 'free time'.

Question 10: Details of any other businesses based on the farm were asked for in this question.

4.3.2.4 Succession

Question 11: The likely inheritance and succession of farms as well as the perceived options of farmers for the future were examined. First, it was established if there was a potential successor in the household. If there was, it was determined whether the heir is likely to take over the running of the farm in the next five years; if they were, the respondent was asked to specify whether the successor will farm full-time or part-time. If there is no heir to the farm or the heir is not likely to take over the running of the farm in the next five years, it was ascertained what might happen to the farm in the long term. The data from this question is comparable to that which was obtained in the 2002 County Galway Rural Development Study (Frawley *et al.*, 2005).

4.3.2.5 On and Off-Farm Income, Grants and Subsidies

Question 12: The aim of this question was to gauge the impact of decoupling from subsidies from production under the single farm payment (SFP) system introduced in 2005. This question matches one in the 2007/08 Farm Management Survey.

Question 13: The subject of income in a household survey is a sensitive one. It was during the focus group that the best way in which to get a reliable estimate of household income was ascertained. It was found that farmers were most at ease with a categorical type income question. To achieve an answer as close as possible to the actual figure and to keep the burden on respondents as limited as possible, intervals were used with €10,000 increments. Respondents were found to be more willing to divulge income information in the pilot surveys than was expected a priori. Some estimate of farm income was important for the purpose of this research.

Question 14: The only accurate way of determining the actual contribution of grants and subsidies to the farm income is to view farm accounts though this was not an option in the remit of this particular research. Instead, the respondent was asked to estimate the percentage of their farm income that arises from grants or subsidies. In the pilot surveys, it was found that giving the respondent a choice of intervals made it quite easy for the respondent to estimate which category the proportion of their income from grants and subsidies falls into. This question is similar to one in the Farm Management Survey 2007/08 (Kramm *et al.*, 2008).

Question 15: Respondents were asked if they observed a trend in their income level over the previous five years, that is, if their income had increased, decreased or stayed the same. The answer to this question is linked to the answer to the quality of life question in the individual questionnaire.

Question 16: It is necessary to establish if the household (any member) has an off-farm income. It was also necessary to get an estimate of the off-farm income earned by the household. As with the on-farm income question, it emerged in the pilot surveys that a categorical type question provided the highest response rate.

4.4 Pre-testing and Pilot Survey

Good survey practice dictates that pre-testing a survey helps to minimize undue respondent error. Pre-testing the survey provides an opportunity to fine tune the diary and the questionnaires before use in the final survey operation. Bryman (2008) indicates that pilot studies are important for a number of reasons. First, when the main study demands mainly closed questions, open questions can be asked in the pilot to generate the fixed choice answers. If the answers to a question in the pilot are the same from every respondent, the resulting data is unlikely to be of interest because it does not form a variable and, hence, should be omitted from the final diary. A pilot survey also makes it possible to identify questions that may result in the respondent feeling uncomfortable or loosing interest. Questions that seem not to be understood or questions that are often not answered generally become apparent in the pilot and can therefore be omitted from the final survey. Pilot studies are an excellent instrument for determining the adequacy of instructions for respondents completing a detailed self-questionnaire such as the time use diary. Finally, pilot surveys also make it possible to see how well the questions flow and whether it is necessary to restructure the questionnaire in order to improve this.

The first stage of the pre-testing of the field survey instrument for this thesis involved getting knowledgeable colleagues and analysts to review the field survey instrument. The time use diary and the questionnaire were reviewed for technical merit, ease of readability and the inclusion of all relevant questions. The next stage of the pre-testing exercise comprised two parts: cognitive testing and small scale piloting. It should be noted at this stage that the format of the first draft of the booklet required a total of 20 pages (including covers). The diary and accompanying individual and household questionnaires that were pre-tested and piloted are included in Appendix A.

4.4.1 Cognitive Tests

The primary purpose of cognitive testing is to investigate how well questions perform when asked of survey respondents i.e. do respondents understand the question correctly and can they provide accurate answers. Questions that are misunderstood by respondents or that are

difficult to answer can be improved prior to fielding the survey instrument, thereby increasing the overall quality of survey data. Typically, cognitive testing is performed by conducting in-depth, semi-structured interviews with a small number of respondents similar to those targeted in the survey. Data from cognitive interviews is qualitative, and analysis of such data can indicate the sources of potential response error, as well as design flaws and various interpretations of the questions. Unlike a pilot survey, where the primary objective is to produce statistical data that reveals imperfections in the survey design and question construction, the objective of cognitive testing is to provide an in-depth exploration of particular concepts, processes and patterns of interpretation (Iarossi, 2006). This explains why the sample for cognitive testing is much smaller that that for piloting.

Cognitive tests on diary completion were conducted with individuals from ten households. Respondents were asked to complete the diary for the previous day whilst I (the researcher) observed the process and took notes. They were told that every detail of their day, however insignificant they thought it to be, was important. Respondents were also prompted where necessary and encouraged to think aloud. On completion, they were asked about their experiences in completing the diary. Respondents reported having remembered activities retrospectively in two major ways. The most common method was based on routines. The alternative was to remember a key event that happened on the day of the diary and construct the day around it. Most respondents showed difficulties in noting secondary activities as well as differentiating them from main activities. Some left out activities because they deemed them to be either unimportant or obvious. This was mainly due to a tendency to skim very quickly over the instructions at the beginning of the diary. When asked to read the instructions again, more carefully, most reported that they had a better understanding of how to complete the diary. However, they suggested that the inclusion of a sample diary would greatly aid their understanding of how the diary should be completed.

At the end of each diary day, the respondent was asked a number of questions about the diary and the day for which they completed the diary. This included questions on whether the respondent encountered any problems completing the diary and if there were any activities they felt that were not covered on the list. The cognitive tests showed that there was no activity included in the diary which covered the various types of farm maintenance that farm operators engage in. Subsequently, an activity code was included in the diary for farm

maintenance such as fencing, building walls, felling of trees or the maintenance of machinery. Respondents general attitude towards the initial design of the diary were not particularly positive. They reported that the length of each diary day (six pages) and the number and small size of the squares on each page was off-putting, even before attempting to fill out the diary. It was felt that the structure of the diary should not be changed, at least until the survey was piloted and a larger number of people had provided feedback on its configuration. However, respondents were very clear and positive on how the results were going to be used and why this research is focused on how they spend their time.

The cognitive test covered the interpretation of questions in the individual and household questionnaire as well as diary completion. This permitted an assessment as to whether respondents interpreted all questions in the manner intended, both in the fundamental sense that they understood all the words, as well as that they understood the broader intent of the question. The cognitive test also verified that the response scales were appropriate, understandable and correct. Interpretation of the questions did not pose any difficulty for respondents though many of the respondents had difficulties calculating the number of hectares of land they owned, rented-in, leased, etc. To address this, a column was added to the question whereby the respondent could report their answers in either hectares or acres.

4.4.2 Small Scale Piloting

The final stage of the pre-testing involved a small-scale pilot of the time use field instrument[23]. The pilot survey was administered to people who had not participated in the cognitive interview and revision process. The small-scale pilot was conducted between September 6th and October 15th 2010 with eighty households in counties Galway and Mayo. The aim of the pilot study was to assess the effectiveness of the survey documents, particularly the diary instrument as the cognitive testing did not return a lot of feedback on the diaries themselves. The surveys were posted to the sample of households. Respondents were asked to return the survey by post, using the stamped addressed envelope provided. Forty households were sent pre-notification letters informing them of the nature of the study

[23] The small-scale pilot was performed using the revised survey instrument (subsequent to the cognitive tests).

and that they would receive a survey in the post in the week that followed. They were given the option to call or e-mail the researcher if they wished not to receive the survey. The other forty households did not receive a pre-notification letter and the survey was posted directly to them including a letter outlining the purpose of the research.

The pilot survey tested four drafts of the diary[24]:

1. 15 minute interval diary with pre-notification letter	20	40 with pre-notification letters
2. 30 minute interval diary with pre-notification letter	20	
3. 15 minute interval diary without pre-notification letter	20	40 without pre-notification letters
4. 30 minute interval diary without pre-notification letter	20	

The response rates for surveys that were sent following a pre-notification letter, with 15 and 30 minute interval diaries were 15% and 5% respectfully. The response rates for surveys that were sent without a pre-notification letter, with 15 and 30 minute interval diaries were 10% and 5% respectfully. This was a surprising result in itself, as one would assume that the diary with 30 minute intervals (4 pages per diary day) would generate a larger response than the longer diary (6 pages per diary day) with 15 minute intervals. This result demonstrates that, while the 15 minute time intervals result in longer diaries that are more cumbersome to fill, the response levels are not affected by the length of the diary or the burden associated with completing it. Irrespective of the size of the time interval, of the 40 households that received a pre-notification letter prior to the survey, 10% returned the survey completed. Of the 40 households that did not receive a pre-notification, 7.5% returned completed surveys. While the response rate was low, this result still served to support the assumption that a pre-notification letter would increase the level of response. Furthermore, the results from the piloting instrument were impressive in the quality and clarity of responses. However, it was felt that the cause of the low response rate needed to be determined and addressed for the purpose of the final survey.

Following the feedback from colleagues and the analysis of the results of the cognitive tests and the small scale pilot study, a number of significant changes were made to the final survey

[24] All households were sent the same individual and household questionnaire.

document. Most notably, the overall structure of the diary was altered to make it shorter (two pages per diary day), less burdensome on the respondent and more responsive to the respondents' needs, while allowing the collection of a richer data set. However, a number of the questions in the individual and household questionnaire were also altered in response to the pilot survey. Appendices A and B permit a visual comparison of the design and the content of the survey used for the pilot (first draft) and the final draft of the time use survey document respectfully.

The initial time use diary for one day consisted of six pages, each with thirty one activities and a short list of options for where the respondent was and who they were with, on the left hand side of the page. The diary began at 4.00 a.m. and ended at 4.00 a.m. the following morning. Each respondent was requested to look down through the list of activities and identify the one that corresponded to what they were doing for each of the ninety six fifteen minute time periods[25]. For each primary activity, the respondent was instructed to mark what they were doing with a tick (√) or the number one (1) in each time period. If they were doing two things at the same time, they were asked to put a cross (X) or the number two (2) in a second activity time slot. Respondents were also asked to indicate where they were and if they were with anybody at the time of each activity with a tick (√) or a cross (X). A short list of places and people they may have been with at the time of each activity were located at the bottom of the list of activities. As already noted, respondents expressed their difficulty in completing the diary. Most respondents related the difficulty to the design of the survey, namely the large number of boxes on each page. In fact, some respondents, instead of putting a tick (√) or the number one (1) in each time slot to represent their primary activity, put the number corresponding to the activity they were doing for each 15 minute time period in the top row of boxes. In response to this, it was decided to redesign the structure of the time use diary to make it more responsive to peoples needs.

Using the diary design inspired by the respondents themselves, the time use diary was redesigned so that each diary day fits on just two pages. Identical to the original design, the diary begins at 4.00 a.m. and continues for 24 hours. The list of activities, places and people

[25] Thirty-two episodes on the first two pages, thirty-two on the third and fourth pages and thirty-two on the fifth and sixth pages.

the respondent may have been with are located down the page on the left. In this diary, the ninety-six time periods are all located on one page, adjacent to the list of activities. On this occasion, the respondent was asked to mark, in the box provided, the number corresponding to their main or primary activity for each time period. If they were doing two activities at the same time, they were instructed to mark in the second row of boxes, labelled secondary activity, the number corresponding to the secondary activity they were doing at that time. If they were doing more than two things at the same time, they were instructed to decide which two activities demanded most attention. In the third and fourth rows labelled 'who you were with' and 'where you were', respondents were asked to indicate, using the appropriate number, who they were with, if they were with anybody and where they were at the time of each activity. This innovative 'counting by numbers' diary design is one of the main contributions of this thesis and has the potential to change the way these types of surveys are conducted generally.

In the final draft of the diary, some adjustments were made to the list of activities. The activity 'non-paid activities related to farming' was moved from the voluntary activity group to the farm related activities group, as some respondents reported that they did not see that activity code. In the socialising and going out activity group, the activity for going to concerts, the theatre, the cinema, etc. (activity number 23) was subsumed into the eating/going out activity (activity number 22). The reason for this was because respondents failed to distinguish between these two activities in the pilot survey. With regard to the 'where you were' question, respondents noted that they usually allocated travel with work and study. In response to this, travel and work/study were consolidated in one group 'other'. The removal of two activities from the list afforded a slight increase in the font size of the remaining activities, making them easier to read. The shorter two page diary also made it possible to include a sample diary to aid respondents in their understanding of how to complete the diary without making the booklet too long. It is believed that questionnaires work more efficiently and are less susceptible to non-response if the researcher can illustrate to the respondent how the form should be completed. Other changes included rewording some of the activities and the diary instructions to reflect the new diary format.

Additionally, the individual and the household questionnaires underwent some modification. In the individual questionnaire, questions 2 and 3 and questions 11, 12 and 13 were

restructured as filter questions. Questions 14 and 15 were discarded and question 16 was rearranged and an option of working zero hours on the farm was included. Five new questions were included to capture in more detail, information on respondents time allocated to voluntary and civic engagement activities. Question 32, frequency of participation in named organisations in the past twelve months, was reorganised so that is was faster for the respondent to read and answer. In the household questionnaire, question 5, the size of the community, was reworded and open country was changed to village of less than 500 people as respondents noted that they were unsure as to what 'open country' was. Following the advice of colleagues, a question relating to the employment of casual workers on the farm was included. Revisions were made to other questions in each of the questionnaires with the view to formulating more comprehendible answers from respondents. Once the instrument was reviewed and re-piloted to a small number of respondents, it was distributed to the sampling frame.

4.5 Summary

This chapter reviewed the stages in the development of the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey*. This involved a lengthy phase of research, design, testing, editing and finally administering the survey over a seventeen month period. The process began with a qualitative review of the literature relating to the collection of time use data. This was followed by consultations with experts in the fields of agriculture and time use data collection, and members of a focus group. To further inform the design of the survey, cognitive testing was performed by conducting in-depth, semi-structured interviews with a small number of respondents similar to those targeted in the survey. The focus group discussions and cognitive testing highlighted a number of important issues with regard to the design of the time use diaries and accompanying questionnaires. Finally, to test the survey instrument in the field, it was subjected to a small scale pilot, described in this chapter.

The main focus of this chapter has been on the specificities of the time use diary, the options available for each design consideration and the justification for each design choice. They included considerations and decisions in relation to site selection, survey administration approach, continuous recording versus fixed time intervals, open-ended versus pre-coded

activities, ten or fifteen minute time points and the inclusion of contextual and simultaneous information. This chapter further provided a detailed discussion of the site selection and sample determination procedures. Finally this chapter ended with a detailed description of the questions included in the individual and household questionnaires and the motivation for the inclusion of each question.

5. Sample Response Rates and Descriptive Statistics

5.1 Introduction

This chapter presents some sample descriptive statistics from the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey*. The data which forms the basis of this chapter was collected over a seventeen month period from April 1st 2011 to August 31st 2012 in a single-purpose survey. Reflecting the nature of the survey, the chapter analyses the data at both the individual and the household level. It begins in Section 5.2 with a description of how the data was prepared for analysis, while Section 5.3 presents summary information on the response rates. Also included in this section is the distribution of diaries by day and by season, as well as a discussion of the problems encountered by respondents when completing the diaries. This is followed in Section 5.4 by a demographic profile of the farm household members who completed the time use diaries and accompanying questionnaires. Finally, a range of characteristics of the households and of the farms are outlined.

5.2 Data File Creation, Editing and Coding

As observed by Harvey (1993), one of the most challenging aspects of the analysis of time diary data is the preparation and organisation of the data. It is this process, more than any other, which separates the collection and analysis of time diary data from similar processes in traditional social surveys. As with any other survey, once the completed surveys were received, the forms were edited for accuracy and completeness. The distinctive difference between a time use diary survey, its accompanying questionnaires and a standard questionnaire is in the editing and checking of the diary. Browsing for non-responses to sections and questions that should have been completed is not sufficient. The diary section of the questionnaire was checked for completeness by following it through the day and ensuring that there were no gaps, that all activities and their several dimensions (secondary activity, with whom and where) were reported and that competing activities (e.g. personal care and farm related activities) were not recorded in the one fifteen minute interval. In some instances,

it was necessary to make corrections from the information provided. For example, there was automatic editing of some early morning and late evening data. Missing data from the early a.m. preceded by personal care (includes sleep) and ending in personal care was coded as personal care and similarly missing data from the late p.m. was coded as personal care. The code 99 was used where there was no recorded activity or response (missing) and the code 999 was inserted where no activity was stated, for example, in the secondary activity where a secondary activity was recorded infrequently. True zeros and zeros arising from missing data were distinguished in this way. This editing procedure changed the data recorded in only a small number of time intervals. All surveys were edited, checked and inputted by the author, facilitating the identification and correction of any inconsistencies across the diaries at the earliest opportunity.

Microsoft Office ® Excel 2007 was used to input the data. The coding was loosely based on guidelines extracted from the most recent version of the *Multinational Time Use Study User's Guide and Documentation* (2011) and Eurostat's (2000) *Guidelines on Harmonised European Time Use Surveys*. The completed excel file includes a total of 1,228 variables. Initially, 928 variables were created to facilitate the imputation of the data from the diaries and the individual and household questionnaires. These 928 variables include a variable for each of 96 time points, one for each 15 minute episode, for each diary day. The value of the time point is the code for the activity (30 activities) being performed at that time. There are a further 96 variables representing each secondary activity, whom the respondent was with and where they were for each diary day. Once the diary and questionnaire data was inputted, the cleaning and preliminary analysis could begin.

Because the initial data extracted from the diaries was time allocation by activity for 96 fifteen minute episodes, it was necessary to summarise for each diary day the time allocation by activity (30 activities). That is, the total time spent on, for example personal care, at various times of the day was consolidated into daily time spent on personal care. This was done by creating 300 new variables, including variables counting the number of episodes in which each respondent was doing each of the 30 activities as a primary or a secondary activity during each of the diary days. Variables calculating the number of minutes each respondent spent doing each activity either as a primary or secondary activity on each day were then constructed. Similarly, time devoted to various social contacts and locations were

summed over each day and variables created counting the number of episodes and, accordingly, the duration of time on the diary day allocated to the given social contact (alone, household member or with others) and location (at home, in the community or other place).

Following this, the data was exported into STATA® version 12 for preliminary and econometric analysis. The first step in the analysis procedure was to do a preliminary check of the data to ensure that there were no inconsistencies in the data that had not emerged during inputting e.g. a 15 minute episode having been coded as sleeping in the middle of the day during what was obviously an otherwise continuous period of paid employment. These checks were done using the basic descriptive statistical functions in STATA® including frequency tables, tabulations and scatter plots. Any errors or outliers discovered were corrected, where possible, by referring back to the hard copy of the survey concerned. Observations with diaries that did not contain any main activity information were dropped.

5.3 Response Rate

5.3.1 Household Level Response Rate

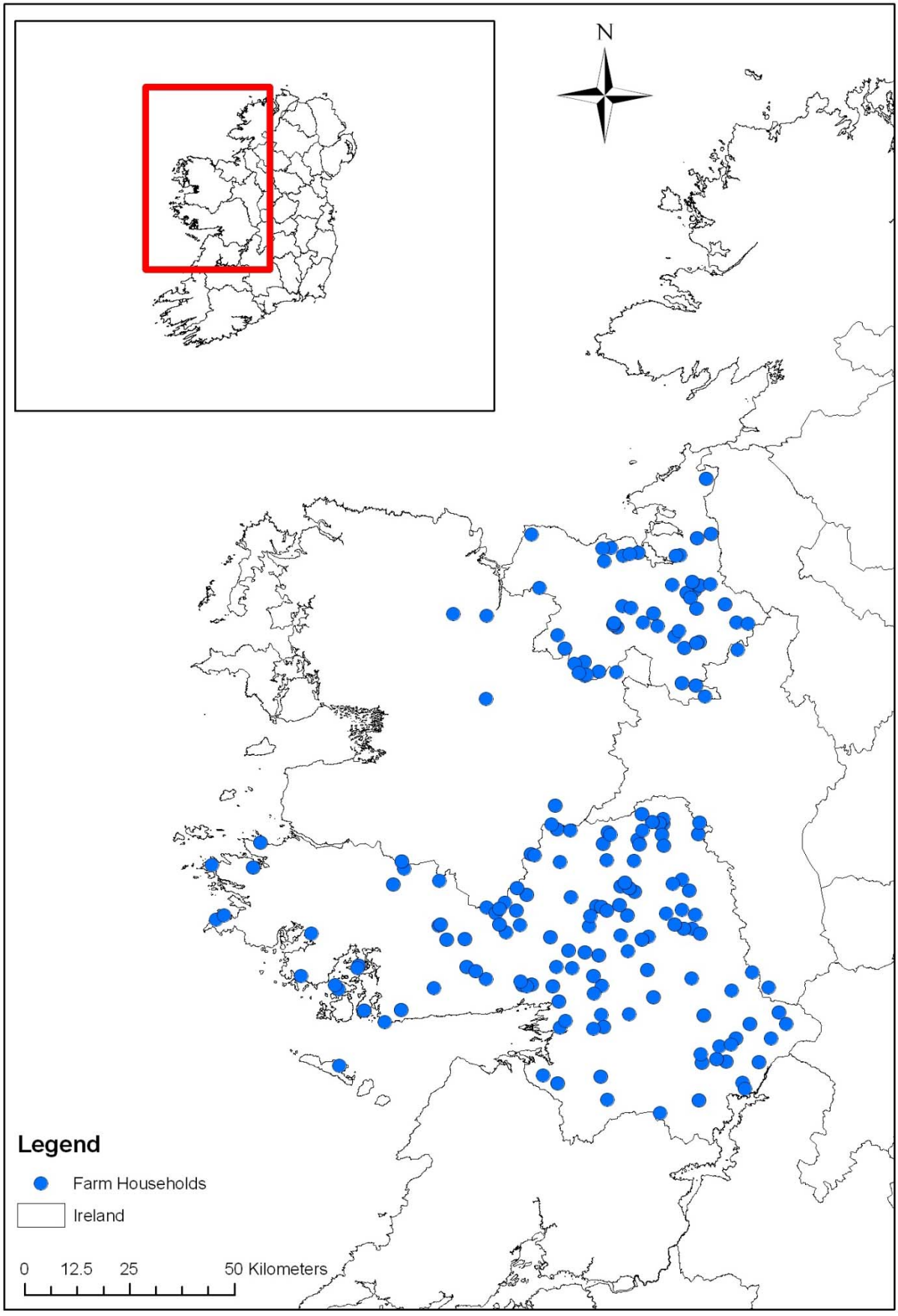
A total of 2,290 households were identified for participation in the study. A package (referred to in Section 4.2.11) including two time use diary 'booklets' and accompanying household questionnaire was posted to each of these 2,290 households. Due to insufficient addresses, because the householder had moved away, the household was derelict or demolished or because the person at the address was deceased, 288 of these packages were returned unopened. These 288 addresses were ineligible for inclusion in the survey and so are excluded from the calculation of the response rate. This left 2,002 eligible households from which 211 or 11% returned at least one of the booklets and/or the household questionnaire. Of the 211 households that returned surveys, only surveys from 191 of the households were deemed valid as either the household questionnaire or a diary was missing making the household response rate 10% (Table 5-1).

Table 5-1 Household Level Response Rate

Household Level Response	No.
Households Identified for Participation	**2,290**
Insufficient Addresses	117
Gone Away/ Derelict/Demolished	86
Deceased	85
Total Not Delivered	288
Eligible Households for Participation	**2,002**
Returned (Partial/Complete)	211 (11%)
Households who Returned Valid Surveys	**191 (10%)**

As discussed in Section 4.2.3, data for this study was collected using self-administered postal surveys. As the postal address for each household that returned a survey was available, it was possible to estimate the spatial (x, y) coordinates for each household that returned a survey and map them using Geographical Information Systems (GIS) technology, specifically ArcGIS. Of the 2,290 households that were identified for participation, 67% were in county Galway, 24% were in county Sligo and 4% and 5% were in counties Roscommon and Mayo respectively. Figure 5-2 shows the location of the 191 households that returned valid time use diary surveys. Of these, 129 (68%) of the households are located in county Galway, 45 (24%) of the households are in county Sligo, 10 (5%) are in county Roscommon, with the remaining 7 (4%) in county Mayo.

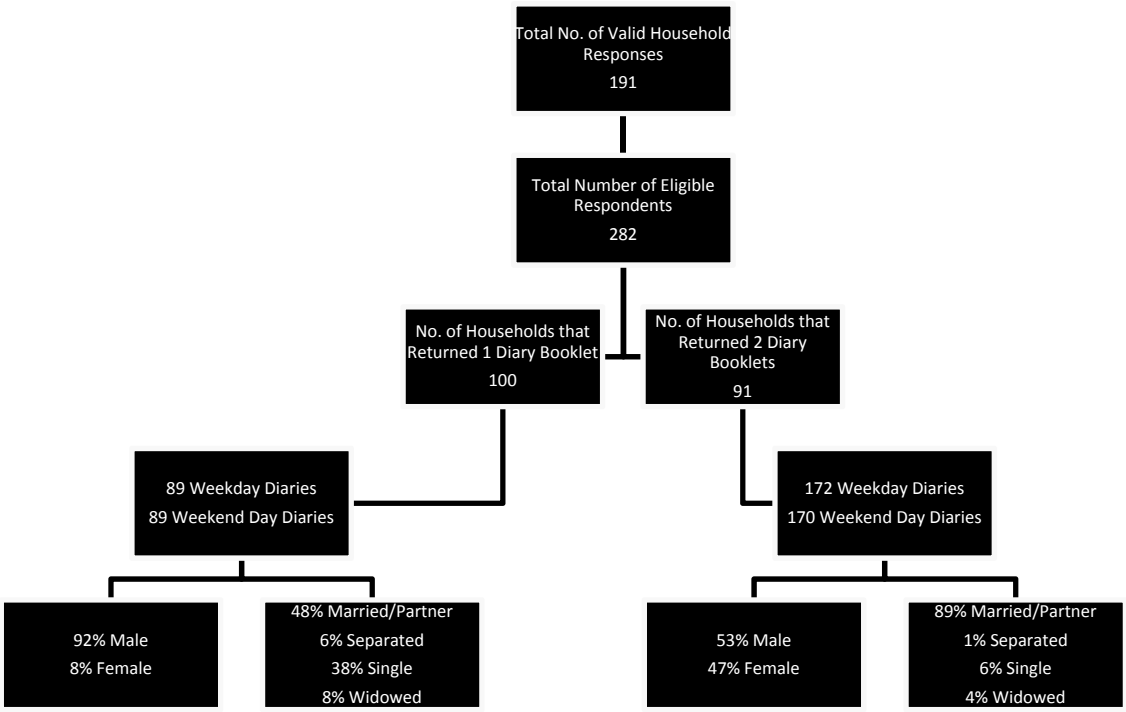
Figure 5-1 Location of Households that Returned Survey Questionnaires



5.3.2 Individual Level Response Rate

The 191 households that participated in the survey returned a total of 282 eligible respondent booklets. 100 households returned one diary booklet and the remaining 91 households returned two diary booklets each. Of the 100 households that returned only one diary booklet, 48% of the respondents were married or had a partner, 6% were separated, 38% were single and 8% were widowed. On the other hand, of the 91 households that returned two diary booklets, 89% of respondents were married or had a partner, 1% of them were separated, 6% were single and 4% were widowed. This demonstrates that it was not always the spouse or partner that filled in the second diary. In some instances a parent, sibling or adult child of the farm operator completed the second diary. Figure 5-3 shows the distribution of the completed diaries.

Figure 5-2 Individual Level Response Rate



5.3.3 Missing Data

Not all diaries that were completed by household members could be used in the analysis as some diaries contained a large number of episodes with missing information. Consequently, although diary booklets were completed by 282 household members from 191 households, all of them could not be used in the analysis. Only diaries which had 81 or more episodes completed were used in the analyses as diaries with 80 or less completed time slots or episodes have more than four hours of unspecified or missing information. Four hours or almost one fifth of a diary day was considered too high a proportion of the day to be missing. In addition, diaries with fewer than 80 episodes tended to be of poor quality and had a lot of unaccounted for time use and missing data from the individual and household questionnaires. Of the 282 weekday diaries, 21 respondents completed 81 episodes or less, implying 261 usable weekday diaries. Similarly, there were a total of 23 weekend day diaries with 81 episodes or less completed leaving 259 weekend diaries for analysis or 520 diaries in total.

5.3.4 Daily and Seasonal Distributions of Diaries

Temporal factors such as the day of the week and season greatly affect how time is spent. As certain activities are only undertaken on certain days of the week, time use can vary as a result. Personal care activities such as sleeping and eating are typically carried out everyday, while paid employment is usually done Monday through to Friday. Activities related to farming are generally undertaken seven days a week, though specific farm related activities are subject to seasonal variation. Outdoor activities such as sports and physical exercise are also weather dependent, and since there is considerable variation in both temperature and daylight in Ireland, particularly in the West, this is reflected in the time allocated to such activities. For this reason, it is important to consider the distribution of diaries across days of the week and across seasons.

As outlined in Section 4.2.8, the designated days for which the diaries were to be completed were spread evenly across days of the week and throughout the calendar year. Table 5-2 presents the distribution of usable diaries returned by weekday. The least number of usable diaries were returned for Tuesdays and the most were returned for Wednesdays. On the

whole, the reference days for weekday diaries were distributed more or less evenly throughout the week with close to 20% of diaries completed on each day.

Table 5-2 Distribution of Weekday Diaries by Day of the Week

	Weekday Diaries	
	%	(n)
Monday	18.5	(48)
Tuesday	17.7	(47)
Wednesday	23.0	(60)
Thursday	22.3	(58)
Friday	18.5	(48)
Total	**100.0**	**(261)**

Table 5-3 presents the distribution of usable diaries returned by weekend day. 136 usable diaries for Saturdays were returned compared to 123 usable diaries for Sundays. Overall, weekend day diaries were relatively evenly distributed between Saturdays and Sundays.

Table 5-3 Distribution of Weekend Diaries

	Weekend Diaries	
	%	(n)
Saturday	52.5	(136)
Sunday	47.5	(123)
Total	**100.0**	**(259)**

As people have a limited supply of time, they face trade-offs when allocating time to various activities. Certain activities are more likely to be carried out in the months when the climate is temperate and other activities when conditions are inclement. Spending more time doing an activity because of the time of the year results in less time spent doing other activities. This is most evident in relation to farm household members, as agricultural work revolves around the seasons. During seasons when farm related activities are more labour intensive, requiring a higher investment of time, less time is available for other activities, such as leisure and volunteering. Thus, it is important to control for seasonal variation with regard to time use. Table 5-4 presents the seasonal distribution of weekday and weekend day diaries. Despite diaries being distributed to respondents evenly throughout the year, a higher proportion of

usable diaries returned were completed during the autumn and winter months. Slightly less than a quarter of weekday diaries returned were completed during the months of Spring and Summer, while just 19% of the weekend day diaries returned were completed during February, March and April. Due to the uneven distribution of diaries across the four seasons, the subsequent analysis will control for seasonal variation.

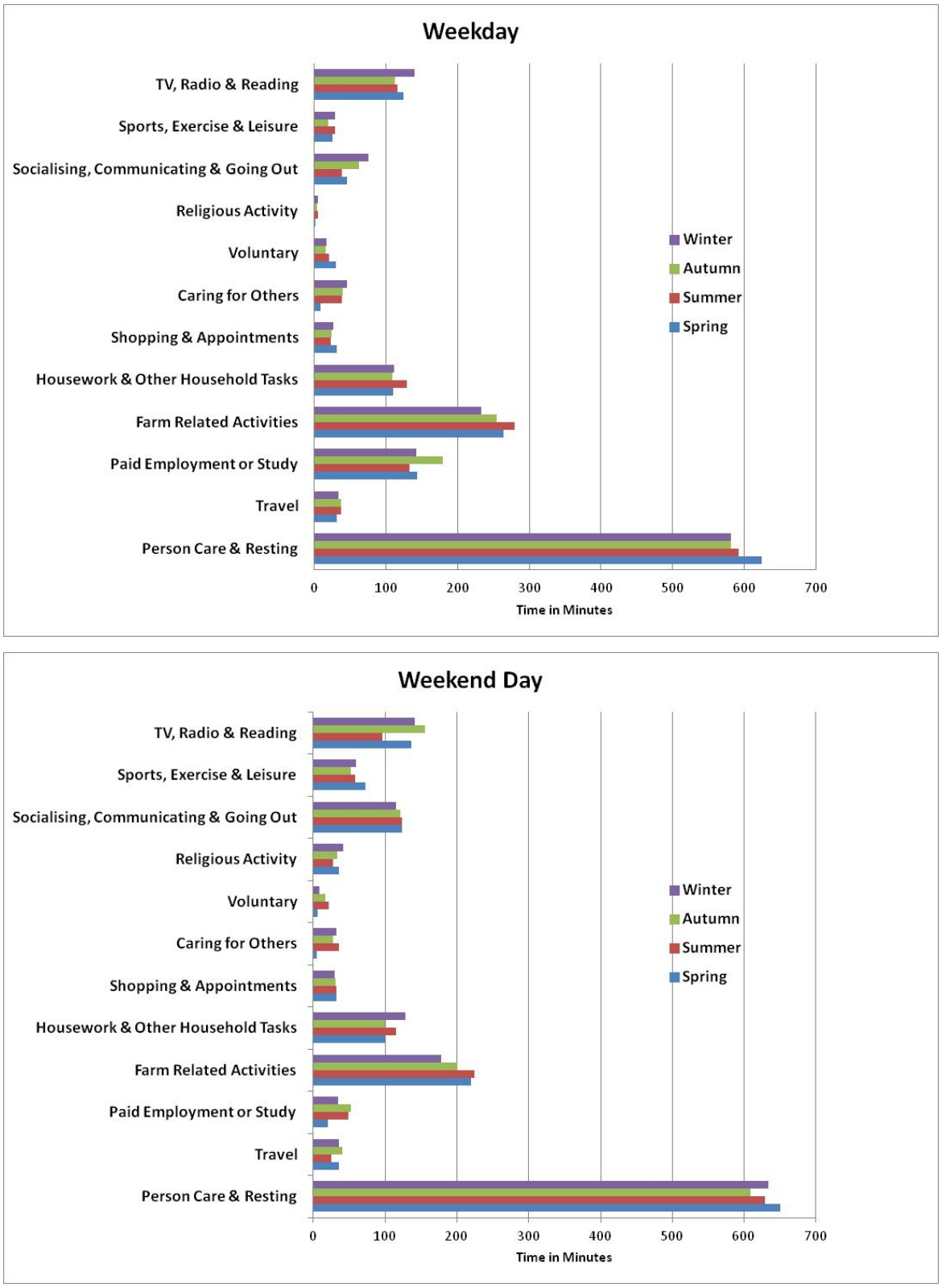
Table 5-4 Seasonal Distribution of Diaries

Season in which the Diary was Completed	Weekday		Weekend	
	%	(n)	%	(n)
Winter	23.0	(60)	25.4	(66)
Spring	20.3	(53)	18.6	(48)
Summer	22.6	(59)	22.8	(59)
Autumn	34.1	(89)	33.2	(86)
Total	**100**	**(261)**	**100**	**(259)**

Figure 5-3 presents a graphical illustration of the effect of seasonal variation on all activities on weekdays and weekend days. The twelve activity groups on the vertical axes represent an aggregation of the thirty activity codes in the time use diary as discussed in Section 4.2.10. Average time (in minutes) is represented on the horizontal axes. As expected, the seasons have an impact on the number of hours farm household members allocate to farm related activities. For example, respondents allocate more time to farm related activities in spring and summer than during autumn and winter, irrespective of whether the activity was done on a weekday or a weekend day. Respondents also spend longer doing sports related activities and getting exercise during spring and summer. This is most likely because the weather is more temperate during these months. A larger proportion of time is spent socialising, communicating and going out on weekdays in autumn and winter, but on weekend days in spring and summer. This may be due to farm household members spending more time working on the farm on weekdays during the months of spring and summer. On weekdays a larger proportion of time is allocated to voluntary activities such as civic engagement and helping other households informally during spring and summer compared to autumn and winter. On weekend days more time is allocated to voluntary activities in summer and

autumn. A more comprehensive analysis of seasonal variation across all activities is presented in Section 7.5.2.

Figure 5-3 Average Time Allocated to Activity Groups by Season



5.3.5 Timing of Diary Completion and Respondent Feedback

At the end of each diary, respondents were asked to complete a list of six questions relating to the diary day. This section examines the results from two of those questions. It should be noted that Section 4.2.7 includes a more detailed description of the questions and the rationale for including them in the survey. Table 5-5 presents the distribution of diaries classified according to when the diary was completed. Of the weekday diaries, 18% were completed 'now and then' during the diary day itself, while 46% were completed at the end of the diary day. Only 22% of diaries were completed the day after the diary day and just over 14% were completed more then 24 hours after the diary day. The distribution of completion times is broadly similar for weekend diaries with 21% being completed throughout the diary day, 30% at the end of the diary day, 30% the day after the diary day and just over 18% of weekend day diaries were completed more than 24 hours later.

Table 5-5 Distribution of Usable Diaries Classified According to When Diary was Completed

When did you complete the diary?	Weekday		Weekend	
	%	(n)	%	(n)
Now and then during the diary day	17.7	(46)	21.4	(55)
At the end of the diary day	45.8	(119)	30.0	(77)
Day after the diary day	22.3	(58)	30.4	(78)
At a later time	14.2	(37)	18.2	(47)
Total	**100.0**	**(260)**	**100.0**	**(257)**

At the end of each diary day respondents were also asked to indicate whether or not they experienced any problems completing the diaries. Ten of the respondents who returned weekday diaries and twelve of the respondents who returned weekend day diaries recorded that they had experienced problems completing the diary. The most frequently identified problems are listed in Table 5-6, though these numbers should be interpreted with caution as only a relatively small percentage (approximately 5%) of respondents recorded having experienced problems completing the diaries.

Table 5-6 Problems Encountered in Completing Diaries Among Those Who Experienced a Problem

Nature of the Problem	Weekday		Weekend	
	%	(n)	%	(n)
Time consuming/too busy	10.0	(1)	8.3	(1)
Tedious to complete	10.0	(1)	16.6	(2)
Too long/complicated/detailed	44.0	(4)	33.3	(4)
Remembering to complete it	10.0	(1)	0.0	(0)
Other	20.0	(2)	33.3	(4)
Total	**100.0**	**(10)**	**100.0**	**(12)**

5.4 Descriptive Statistics

5.4.1 Introduction

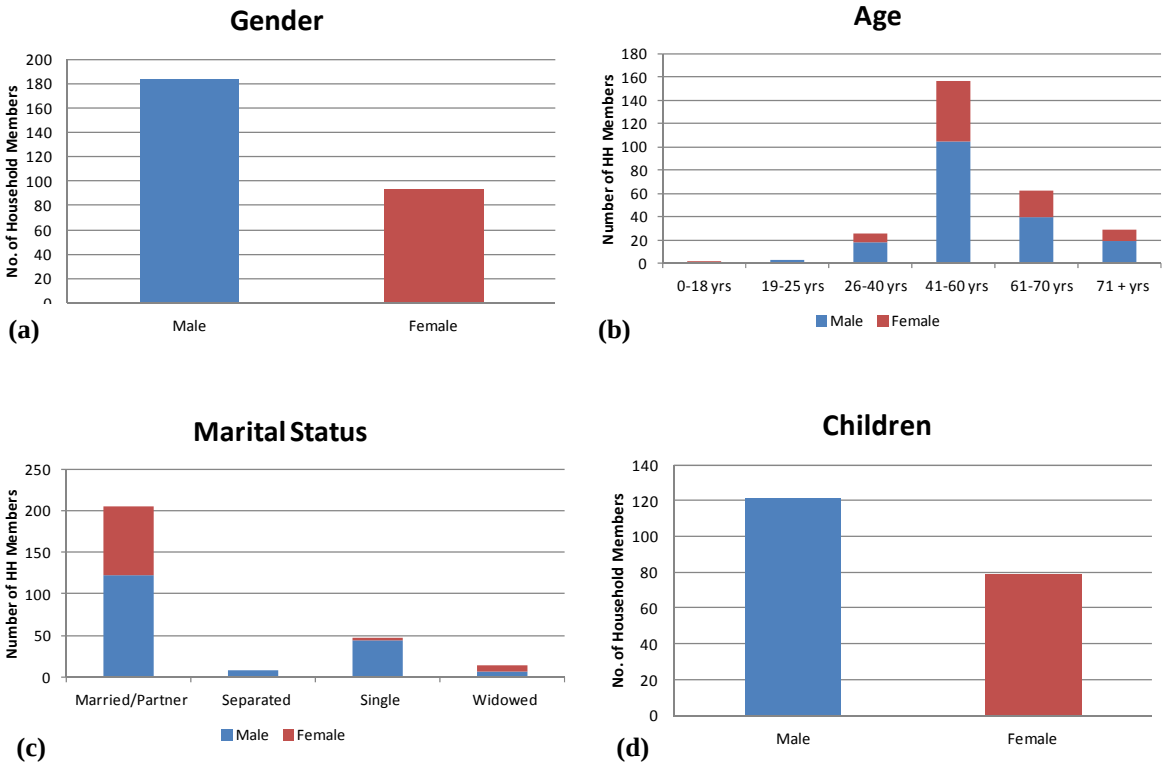
This section presents a demographic profile and a summary of selected key socio-economic characteristics of the 191 households and the 282 farm household members who completed the time use diaries and accompanying questionnaires. The results are presented in an order most conducive to analysis, though not necessarily in the same order as the questions appear in the questionnaire. It should be noted that 70 percent of diaries returned were from self-designated farm operators, of whom 95 percent were male. Because of this, gender differences in the allocation of time to various activities can be quantified and as most of the males in the sample are farm operators, differences between the time allocation of the farm operator and other household members can be highlighted.

5.4.2 Demographic Profile

This first sub-section describes a range of characteristics of the individual farm household members relating to gender, age, marital status, and child status. In particular, Figure 5-4 provides a graphical illustration of the demographic profile of the respondents to the *Time Use of Farm Household Members in the West of Ireland 2011/2012* survey across these

dimensions. The majority of respondents are male (66%), mainly because a large proportion of households returned only one diary survey, completed by the main farm operator, and 95% of main farm operators in the sample were male. The average age of respondents to the survey is 55 years. The highest proportion (57%) of respondents are in the 41-60 years of age category, with 33% of respondents 60 years of age or over and only 10% between the ages of 18 and 40. Three quarters of the sample reported being married or having a partner, while 17% are single. The remainder (8%) are either separated or widowed. Just under three quarters of farm household members have children, with 61% of males and 69% of females reporting that they are parents. The average number of children per household is 3.4. This is higher than the national average of 1.4 children per family reported in the 2011 Census of Population (CSO, 2012b). This may be explained in part by the fact that according to the *Census of Population 2011 Report,* rural families were, on average, larger (1.5 children) than those in urban areas (1.3 children). It may also be attributed to the large proportion (75%) of the sample that are married or have a partner and consequently more likely to be parents.

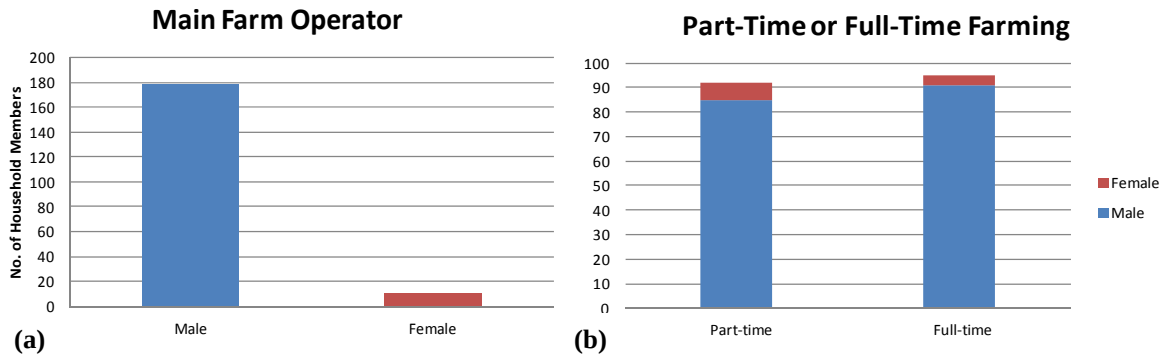
Figure 5-4 Demographic Profile of Farm Household Members in the West of Ireland (Sample: 282)



5.4.3 Employment and Education

This section looks at the employment status and the educational level of respondents. To start, Figure 5-5 provides a graphical illustration of the breakdown of farm operators by gender and full-time/part-time farming status. Main farm operators account for 68% of respondents to the survey and of those, just 5% are female. Of the 188 farm operators in the sample, 51% consider themselves full-time farmers, while the remaining 49% labelled themselves part-time farmers. Those who classified themselves as part-time farmers did not consider farming as their primary occupation with 66% of them having an off-farm job. Just 10% of farm operators who considered themselves full-time farmers have an off-farm job.

Figure 5-5 Profile of Farm Operators (Sample: 282)



Of the 282 farm household members that responded to the survey, 40% have an off-farm job. In 49.5% of the households surveyed either the farm operator or the other survey respondent has an off-farm job. This is consistent with the data from the NFSs which reported that the number of households where either the farmer or spouse were employed off farm declined from 51.3% in 2011 to 49.4% in 2012 (Teagasc, 2012; 2013). For farm household members working off-farm, the most prevalent occupation in terms of the numbers participating are, in order of importance, building and construction, farming, fishing and forestry and professional, technical and health (Table 5-7). For farm household members who work off the farm, the average number of off-farm hours supplied per week is 31 hours ranging from those who do a minimum of two hours per week to those who do a maximum of 64 hours per week.

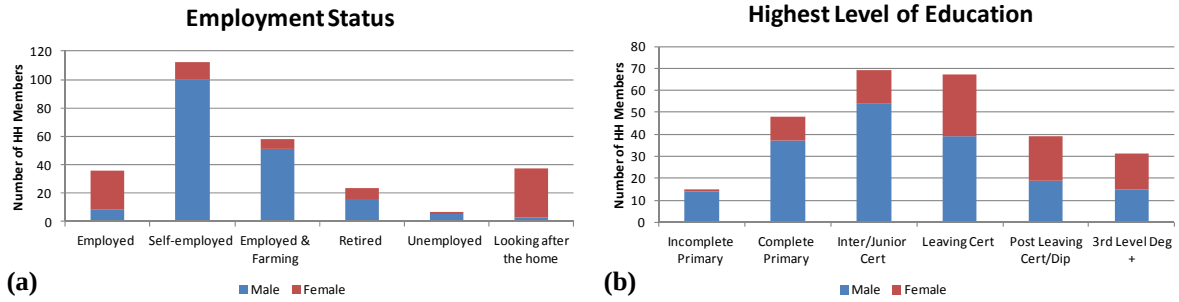
Table 5-7 Occupation Group (Broad Economic Sector) of Off-Farm Employment Participants

Occupation	%
Farming, fishing and forestry workers	17.0
Manufacturing workers	8.0
Building and construction workers	18.0
Clerical, managing and government workers	5.0
Communication and trsnsport workers	13.0
Sales and commerce workers	7.0
Professional, technical and health workers	17.0
Services workers	13.0
Other workers	2.0
Total	**100.0**

The largest proportion of the sample (41%) are self-employed (including full-time farming), while 21% of respondents are employed off the farm and farming simultaneously. Respondents who are employed and not farming make up 13% of the sample, with those looking after the family or the home comprising another 13% (Figure 5-6).

Also presented in Figure 5-6, the share of respondents who have not completed primary level education is 6% while the highest level of educational attainment for 18% of respondents is complete primary education. Aggregated, half of respondents have achieved a Junior Certificate qualification (formally known as the Group or Intermediate Certificate) or less as their highest level of educational attainment. A quarter of respondents have completed their Leaving Certificate, while just 11% of respondents have a third level degree or higher. Across the whole sample, respondents have spent an average of twelve years in formal education. In an attempt to consider agricultural courses the respondent may have completed, respondents were also asked if they had completed a farm apprenticeship under a formal scheme or any part-time or full-time courses on farming related subjects. Ninety two (34%) of all respondents have completed some form of agricultural related course in the past. Of those that have completed a farm apprenticeship or any part-time or full-time course, 88% were male and the remaining 12% were female.

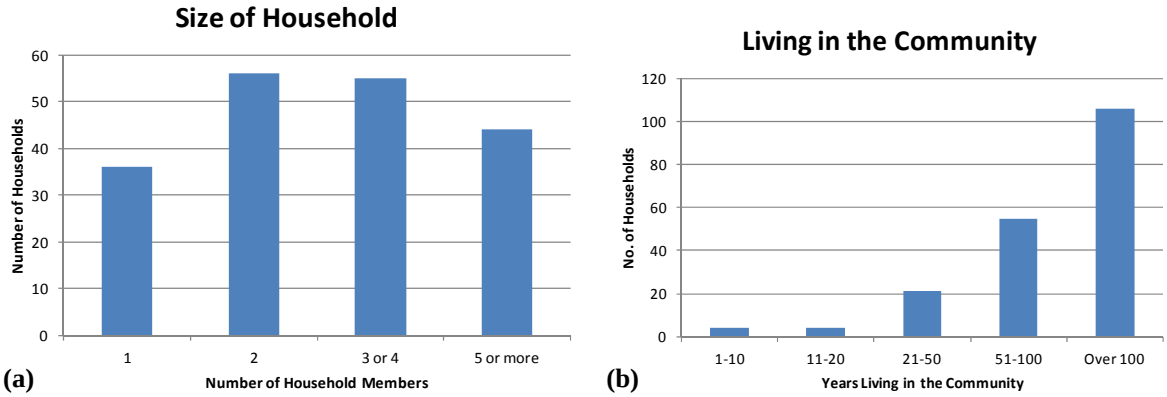
Figure 5-6 Demographic Profile



5.4.4 Household Characteristics

This sub-section presents a brief discussion of the basic household characteristics of respondents, including household size and length of time living in the community. Figure 5-7 (a) shows that a large proportion of households in the sample consist of two, three or four members, with an average of 3.1 persons per household. This is relatively high compared to the national average of 2.7 persons per household reported in the Census of Population 2011 (CSO, 2012b). There are a surprisingly large number of households with five or more persons. This is likely attributed to the larger than average number of children per family in the sample. Thirty six respondents (13%) were living on their own, with the majority of those (87%) being male. Half of those living alone were between 41 and 60 years of age and predominantly single (78%), while 8% reported that they were widowed. Rootedness or length of time a family has resided or been farming in the same area was one dimension of community examined. Most families (85%) have resided in the same place for fifty years or more, with the largest proportion (56%) living in the area for one hundred years or more. Less than 1% of households indicated that they had any plans to move from their address in the near future. These results point to a rural population that is geographically stable and settled. The other dimensions of community examined were the size of the community to which the respondent belongs and the distance of the household from the nearest village, town or urban centre. Almost three quarters of farm households are located in communities with less than 500 people and farm households are located an average of 5.8 kilometres from their nearest village, town or urban centre.

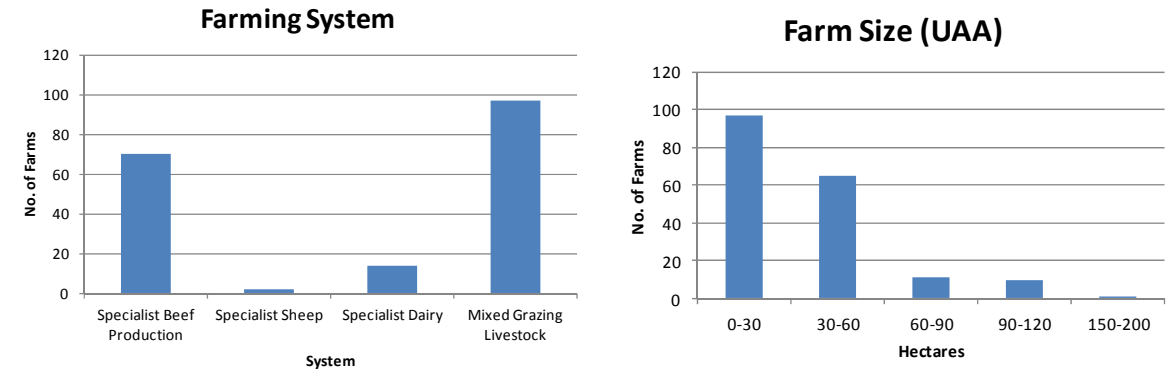
Figure 5-7 Household Characteristics



5.4.5 Farm Characteristics

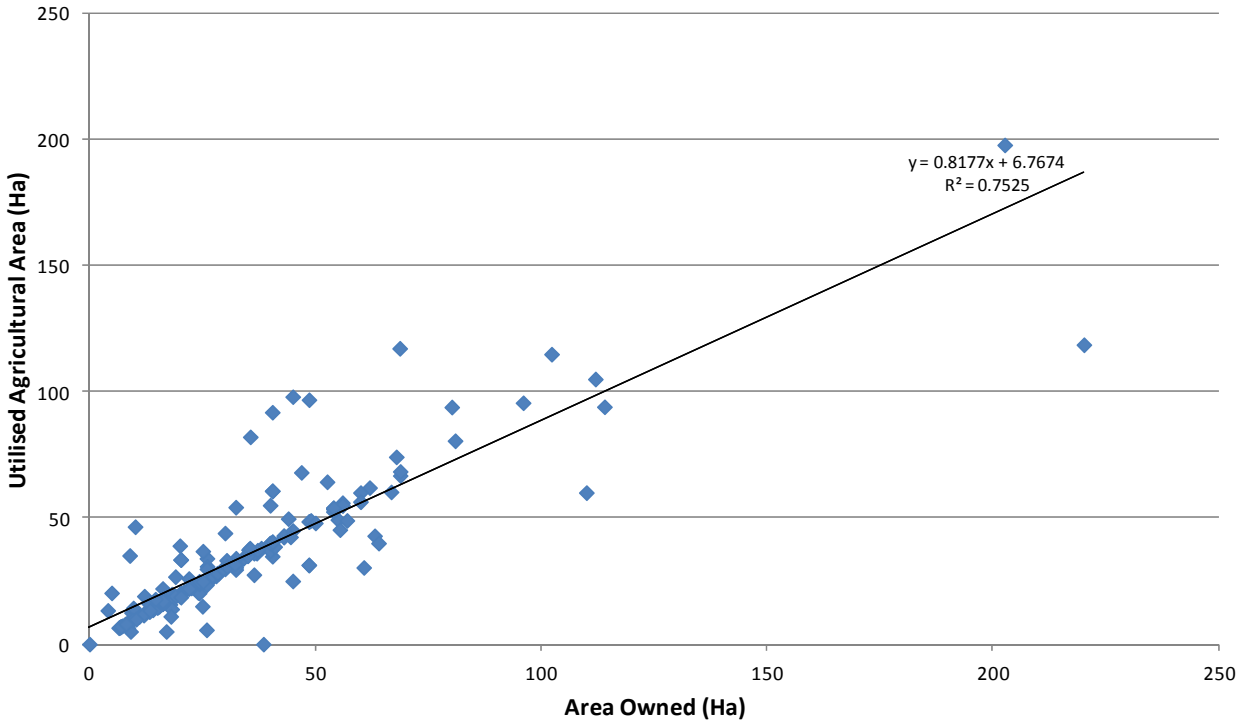
This sub-section outlines data on farm type or system and farm size. Farm household members were asked to choose their main farming system from a list of six (Figure 5-8(a)). Since there were zero responses for specialist tillage or other farming system, these are not illustrated on the graph. The largest proportion (53%) of farm households are involved in mixed grazing livestock i.e. a farming system consisting of a mixture of beef cattle, suckling cows and/or sheep. Only a minority indicated an exclusively sheep or dairy enterprise and tillage systems were negligible. The average size (or UAA) of farms surveyed, at 34.1 hectares, is only slightly larger than the national average of 32.7 hectares. The minimum farm size is 5 hectares and the maximum is almost 200 hectares. Thus, the largest proportion (53%) of this sample consists of small farms of between 0 and 30 hectares.

Figure 5-8 Farm Characteristics



Illustrated in Figure 5-9 is the size of the farm that is owned by the farm operator compared to the size of the land that is farmed. It shows that the majority of farm operators own most of the land that they farm. In cases where the number of hectares farmed (UAA) is less than the number of hectares owned by the farm operator, one or a combination of the following is assumed: a number of hectares are leased out (3 households have some land leased out to other farm operators); there are areas that are under woods or plantation (23 farm operators have land under woods or plantation); or a number of hectares are non-agricultural land (91 farm operators have some non-agricultural land). In addition, a higher proportion of farm operators in this sample rented-in land (28%) compared to the 2% that lease-out land.

Figure 5-9 Area Owned versus Area Farmed

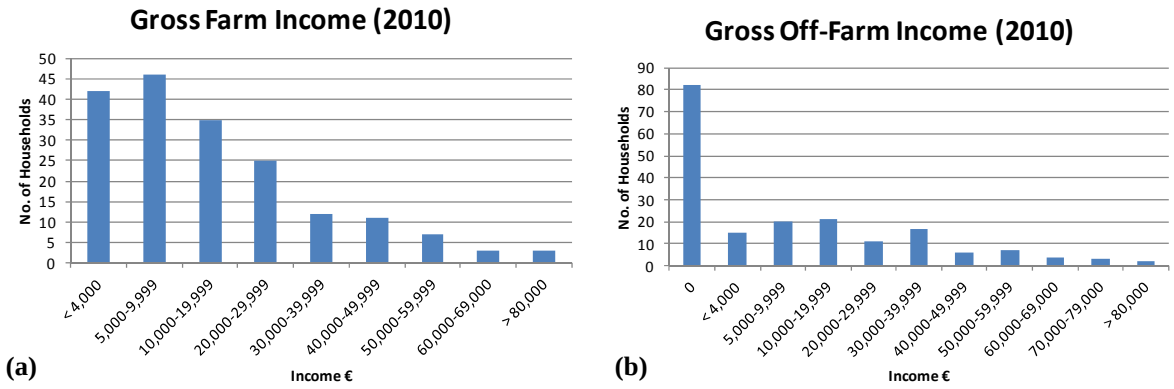


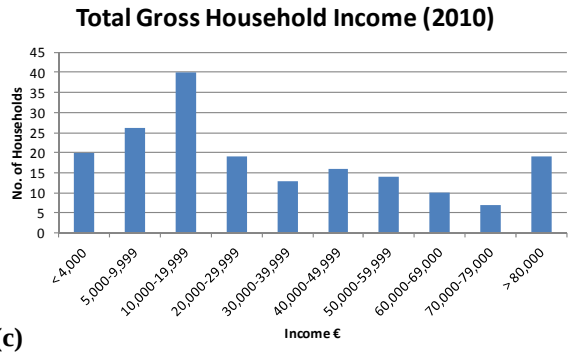
5.4.6 Farm Income

Figure 5-10 summarises details of the farm and off-farm incomes of the farm households in the sample. Approximately 50% of farm households earned less than €10,000 from the farm in 2010 with 52% of all households indicating that between fifty and one hundred percent of their farm income comes from grants and subsidies. The median gross farm income of

households in the sample for 2010 was €11,053, while according to the NFS the national average FFI in 2010 was €18,789 (Teagasc, 2012). Conversely, only a minority of farm households in the survey had farm incomes in excess of €30,000. To get an indication of changes in farm income over the previous five years, the household questionnaire included a question which asked if annual farm income had increased, decreased or remained constant in the five years prior to completing the questionnaire. Of the 191 farm households in the sample, 82% indicated that their income had either decreased or remained constant. It is likely that these low incomes apply pressure to farm households to obtain income from other sources. The uptake of off-farm employment either by the farm operator and/or spouse or partner is the most usual path taken in most areas to supplement farm incomes. It is evident from Figure 5-10 (b) that a large proportion of households sampled, 56%, have a source of off-farm income. The farm operator has an off-farm job in 33% of farm households while in 35% of farm households the spouse or partner has an off-farm job. Only in 12% of households does both the farm operator and their spouse or partner have a job off the farm. The median gross off-farm income for 2010 was €18,500. This suggests that a relatively low proportion of farm households in the sample depend on farming only as a source of income.

Figure 5-10 Details of the Income of Farm Households in the West of Ireland





(c)

5.4.7 Identification of a Successor

The likely inheritance or succession of farms, as well as the perceived options of farm households with regard to the future of the farm, were also examined. Almost three-quarters of households noted that there was a potential heir to the farm in the household. Of those, 35% said that the heir was likely to take over the running of the farm in the next five years, either full-time or combined with a job. 40% said that the heir would not be taking over in the next five years and the remainder were unsure if the successor would assume the running of the farm in the five years that followed. In situations where the farm operator was 60 years of age or older, where there was no potential heir or where the farm operator would not be succeeded in the next five years, a large proportion (27%) noted that they did not know what would happen to the farm in the long term. However, 24% said that the farm would be rented out in the longer term, 19% said that they would sell the farm, while 11% said that the future of the farm would be left to the discretion of relatives. These results would seem to indicate, in Galway, Sligo, Roscommon and Mayo at least, that the future of farming is uncertain.

5.5 Summary

This section provides a brief overview of the individual, household and farm level characteristics of the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey*. Table 5-8 presents a summary of the key individual characteristics of respondents. Two thirds of the sample are male and just over two thirds are the main farm operator. This should be taken into consideration when interpreting time allocation across gender. Farm household members, in this sample at least, are an older sub-group of the population as the

average age of respondents is 55, with 33% of respondents 60 years of age or over. Only 10% of respondents are between the ages of 18 and 40. Compared to the national average of 1.4 children per family (CSO, 2012b), farm households in the West of Ireland, have significantly larger families with an average of 3.4 children. Also worthy of note is that farm household members in the sample have lower levels of educational attainment compared to the national population. Half of farm household members have achieved a Junior Certificate qualification or less as their highest level of educational attainment compared to the 26.5% of the national population that have achieved at least a Junior Certificate qualification (CSO, 2012b).

Table 5-8 Summary of Individual Characteristics

Inidividual Characteristics	Mean (%)	Mean (n)	Std. Deviation
Male	66%	183	0.47
Age	-	55	0.50
Married/Partner	75%	205	0.44
Children	73%	200	0.45
Number of Children per Respondent/Household	-	3.4	2.01
Main Farm Operator	68%	188	0.47
Main Farm Operator - Male	98%	178	0.15
Full-Time Farm Operator	51%	95	0.50
Farm Operators with Off-Farm Job & Farming Part-Time	67%	62	0.34
Farm Operators with Off-Farm Job & Farming Full-Time	10%	9	0.44
All Respondents with an Off-Farm Job	40%	110	0.49
Off-Farm Work Hours per Week	-	14	17.75
Self-Employed (inc. part-time farming)	41%	112	0.49
Employed Off-Farm & Farming Simultaneously	21%	58	0.41
Employed & Not Farming	13%	36	0.34
Looking After Family or Home	13%	37	0.34
Highest Level of Education is the Junior Certificate	50%	132	0.44
Third Level Degree or Higher	12%	31	0.32
Agricultural Related Course	34%	92	0.47
36 Hours or More on Farm Work	34%	92	0.47
Less than 8 Hours per Week on Farm Work	23%	61	0.34

With regard to household level characteristics (Table 5-9), farm households are larger than those of the national population. Compared to the 2011 Census data which reports that 8.5% of the population live alone, a higher proportion (13%) of farm household members in this sample live on their own (CSO, 2012b). Also of interest is that 49.5% of the national population who live alone are male (CSO, 2012b), while 87% of farm household members

who live alone are male. Most farm families have resided or farmed in their communities for fifty years or more (85%), suggesting that they are settled in their communities. Of particular interest is that on 49.5% of farm households either the farm operator or the other survey respondent has an off-farm job, highlighting the reliance of farm households in the survey region on non-farm income. This compares favourably with the NFS data from 2012 reporting that in 49.4% of farm households, either the farmer or spouse were employed off farm (Teagasc, 2013). The median gross farm income of the farm households in the sample for 2010 was €11,053, compared to the national average farm income of €18,789 in 2010 (Teagasc, 2012). This is most likely why, in a large proportion of the farm households in the sample, one of more household members works off the farm.

Table 5-9 Summary of Household Characteristics

Inidividual Characteristics	Mean (%)	Mean (n)	Std. Deviation
Household Size	-	3.1	1.85
Living on Their Own	13	37	-
Living/Farming in the Area for 50 Years or More	84	160	0.37
Living/Farming in the Area for 100 Years or More	56	106	0.50
Have Plans to Move From Current Address in Near Future	1	1	0.07
Household is Located in Community of Less Than 500 People	70	130	0.46
More Than Half of Farm Income Comprised of Grants & Subsidies	51	90	0.88
Distance from Nearest Village or Town	-	5.8km	4.69
Farm Income of Less Than €10,000 per Annum	48	88	0.43
No Income from Off-Farm Job	44	83	0.50
Farm Operator has Off-Farm Job	34	63	0.47
Spouse/Partner has Off-Farm Job	32	60	0.47
Either Farm Operator or Spouse/partner has Off-Farm Job	52	100	-
Both Farm Operator & Spouse/partner has Off-Farm Job	12	23	-
Farm Income has Remained the Same or Decreased in Last 5 Years	82	152	-
Median Gross Farm Income (2010)	-	€11,053	-
Median Gross Off-Farm Income (2010)	-	€18,500	-
Mean Total Income (2010)	-	€16,757	-

Most of the farm households surveyed (53%) are involved in mixed grazing livestock (Table 5-10). Only a minority indicated an exclusively sheep or diary enterprise and tillage systems were negligible. The average size (UAA) is broadly in line with the national average at 34.1 hectares. Three quarters of households reported that there was a potential heir to the farm in the household, though a large proportion (65%) were unsure as to when or if the potential

successor would take over the running of the farm. This suggests that the future of farming, in the survey area at least, is uncertain.

Table 5-10 Summary of Farm Characteristics

Inidividual Characteristics	Mean (%)	Mean (n)	Std. Deviation
Farm System - Mixed Grazing Livestock	1	97	0.50
Specialist Beef Production	0	69	0.49
Average Farm Size (UAA)	-	34.1ha	26.95
Rent-In Land	0	60	-
Lease-Out Land	0	12	-
Potential Sucessor to the Farm in the Hosuehold	1	131	0.46
Heir Likely to Take Over Running of Farm Full-Time in Next 5 Years	1	7	0.22
Heir Likely to Take Over Running of Farm Combined with a Part-Time Job In Next 5 Years	0	40	0.46

6. The Allocation of Time by Farm Household Members

6.1 Introduction

People face trade-offs when deciding on how to allocate their time. For example, more time spent on one activity usually means less time on another. Time use data offers the potential to study the trade-offs that people face e.g. between time spent in paid employment, housework, and leisure time activities such as reading, watching television and sport, civic engagement, commuting, and volunteering. Within this context, farm household members have an additional activity to which to allocate their time, farm related activities. As outlined in Chapter 1, with continued structural changes in the Irish agricultural sector, more farms in the small size category have an off-farm income and there is a growing incidence of part-time farming. In the face of this, time spent on farming related activities and work off the farm may lead to trade-offs in the form of less time spent on leisure, voluntary and civic related activities for example. Thus, the objective of this chapter is to present an overview of the typical patterns of time use of farm household members in the West of Ireland and to examine the trade-offs they are faced with. It gives new insight into how much time Irish farm household members spend on various activities and what they do with their free time. It also permits a better understanding of the role of gender in shaping daily time use and activity patterns.

The *Time Use of Farm Household Members in the West of Ireland Survey 2011/12* required respondents to provide information on two 24-hour periods, one weekday and one weekend day. A total of thirty activity categories were specified: one relating to personal care, sleep and rest, one for travel, three describing employment and study, five detailing farm related activities, three related to housework and other household activities, one for shopping and running errands, two reflecting caring activities, two describing voluntary activities, one for religious activity, three detailing socialising and communicating, five chronicling sports, exercise and leisure activities and two relating to passive activities such as watching television, listening to the radio and reading. A total of 520 usable diaries were collected from 282 individuals in 191 farm households.

Sections 6.3 and 6.4 present the results and a description of the average time spent on each of these thirty activities by the total survey population and by participants/doers. Also included is the proportion of the sample who participated in each activity. Much of the analysis in these sections is descriptive and consists of cross-tabulations of key variables in an attempt to illustrate potential relationships. Some of the relationships are then examined in greater detail in the subsequent chapters. Where appropriate, the existence of relationships between variables is tested for using the non-parametric Kruskal-Wallis and Mann-Whitney U tests and these methods are outlined in Section 6.2. As the focus of this thesis is the allocation of time to civic engagement, voluntary and leisure activities, all results are presented with an emphasis on these activities. Because results of the first time use study carried out on farm household members in Ireland are reported, it cannot be fully evaluated whether time spent on various activities has increased or declined over time. However, the data does allow cautious comparisons between the results from this study and the first national results on time use in Ireland from the Irish National Time Use Survey conducted in 2005 (ESRI, 2005) [26].

6.2 Methods

6.2.1 Summary Statistics

When analysing time use data, there is a range of issues to consider in relation to how activities are reported. Results are often reported as mean hours or minutes spent on particular activities by particular subgroups of the population, for example, male and female. These averages can be calculated in two ways, which can give very different results. First, the average can be calculated based on all members of the particular subgroup, whether or not the individuals in that subgroup have spent time on the activity in question. Second, the average can be calculated based on those members of the subgroup who actually performed the particular activity during the time period under consideration. The difference between the two estimates would be virtually non-existent with respect to activities such as sleeping and eating, where it is expected that almost all individuals spend some time on the activity during

[26] Unfortunately it is not possible to make explicit comparisons between the *Time Use of Farm Household Members in the West of Ireland Survey 2011/12* and the survey conducted by the ESRI because it is not possible to identify farmers or individuals living in farm household from the ESRI dataset.

any given day. In contrast, the difference can be significant for activities where only a small proportion of the population, and a different proportion for different subgroups, engages in the activity. The latter is likely to be the case for leisure, voluntary and civic related activities. Both methods of presenting information are relevant, it is their meaning and interpretation that differs.

6.2.2 Tests of Significance

Where appropriate in this chapter, the existence of statistical relationships between variables is tested for using the Mann-Whitney *U* test, the Kruskal-Wallis test, the Wilcoxon signed-rank test or a Chi-square test. As discussed in Section 3.5, time use data consists of both continuous and discrete (exact zeros) values, is non-negative, generally right skewed and distributions of time data contain many zeros. Zeros can arise because an individual may never engage in a given activity *(structural zeros)* or because an individual may not do the activity during the survey period *(sampling zeros)*. Because of the exact zeros, and often because the data is highly positively skewed, the normality assumption is violated. For this reason the non-parametric Mann-Whitney *U* test is preferable to the independent samples t-test and the generalised version of the Mann-Whitney *U* test. The Kruskal Wallis test is the non-parametric equivalent of the one-way independent-measures Analysis of Variance (ANOVA) and the non-parametric Wilcoxon signed-rank test is used in place of the paired samples t-test and therefore the most appropriate test of statistical difference.

The Mann-Whitney *U* test, also called the Wilcoxon-Mann-Whitney test, is a non-parametric test, equivalent to the two sample t-test that is used to compare the means of a non-normally distributed dependent variable for two independent groups. Marascuilo and McSweeney (1977), Conover (1980) and Daniel (2000) note that the Mann-Whitney *U* test is based on the following four assumptions: 1) each sample is randomly selected from the population it represents; 2) the two samples are independent of one another; 3) the original variable observed (which is subsequently ranked) is a continuous random variable; and 4) the underlying distributions from which the sample are derived are identical in shape, though they do not have to be distributed normally. The assumption of identically shaped distributions implies equal dispersion of data within each distribution (Maxwell and Delaney,

2004). Because of this, the Mann-Whitney *U* test, like the t-test for two independent samples, assumes that the underlying population distribution share the same variance. However, the homogeneity of variance assumption is not generally acknowledged for the Mann-Whitney *U* test and because of this the Mann-Whitney *U* test is generally used in lieu of the t-test for two independent samples. Sheskin (2011) points out that there is empirical evidence which suggests that the sampling distribution for the Mann-Whitney *U* test is not affected by violation of the homogeneity of variance assumption as is the sampling distribution for the t-test for two independent samples.

The Mann-Whitney *U* test is mathematically identical to conducting an independent sample t-test with ranked values. In contrast to the t-tests though, it does not compare mean scores but median scores of two samples. Thus, one of the advantages of the Mann-Whitney *U* test is that, by virtue of ranking interval/ratio data, it is much more robust to the presence of outliers, reducing their impact and in some cases eliminating them. Outliers can dramatically influence variability, can be responsible for heterogeneity of variance between two or more groups, and outliers can have a dramatic impact on the value of a sample mean. Another advantage of the Mann-Whitney *U* test is that the samples do not need to have the same number of observations. If the result of the Mann-Whitney *U* test is significant, it indicates there is a significant difference between the two sample medians.

The Kruskal Wallis test is a non-parametric test used when the independent variable has two or more levels. It is a non-parametric version of ANOVA and a generalised form of the Mann-Whitney *U* test since it permits two or more groups. As with many other non-parametric tests, it will not use the values of the observations directly, but first converts the values into ranks. The statistic of the Kruskal-Wallis test is built from the means of the ranks of the observations across the samples, similar to the approach of the one-way ANOVA. ANOVA compares the sample means but it assumes the populations to be normal with equal variance, so in fact it tests whether the populations are identical. The Kruskal-Wallis test does not assume normality or equal variance and instead of comparing sample means it compares sample means of ranks. The results of the Kruskal-Wallis test indicate whether the groups differ in some way, though it does not indicate precisely how they differ.

The Wilcoxon signed-rank test, also known as the Wilcoxon signed-rank sum test, is a non-parametric or distribution free test especially developed to assess the correlation between two ranking lists (Daniel, 2000). It is used in place of a paired t-test, a one-sample t-test or for ordered categorical data where a numerical scale is inappropriate but where it is possible to rank the observations. When data is normally distributed, the mean is equal to the median, thus the mean is used as the measure of centre. However, if data is skewed, as with time use data, the median is a better measure of centre. Hence, instead of comparing two population means, the Wilcoxon signed rank test compares the medians of two populations of samples (Gibbons, 1985; Daniel, 2000). However, it should be noted that caution must be exercised when interpreting results from the Mann-Whitney *U* test and the Kruskal-Wallis test since they are simply testing the bivariate relationship between two variables. Introducing a third or more variables can fundamentally alter the relationship.

6.3 Overall Patterns of Time Use of Farm Household Members

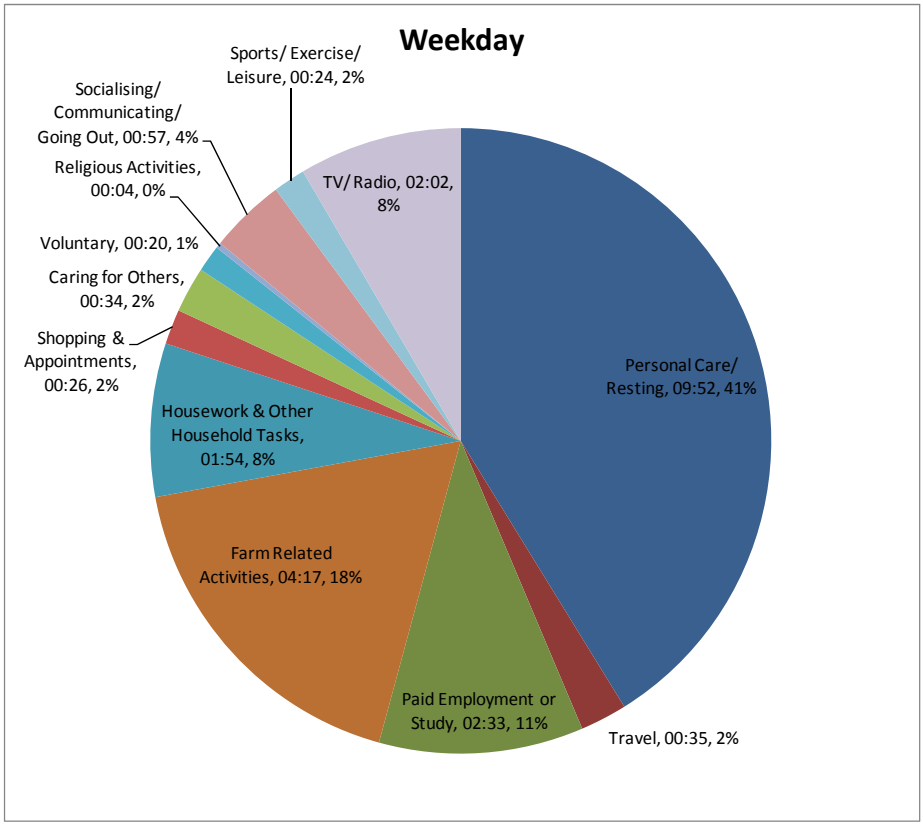
6.3.1 Introduction

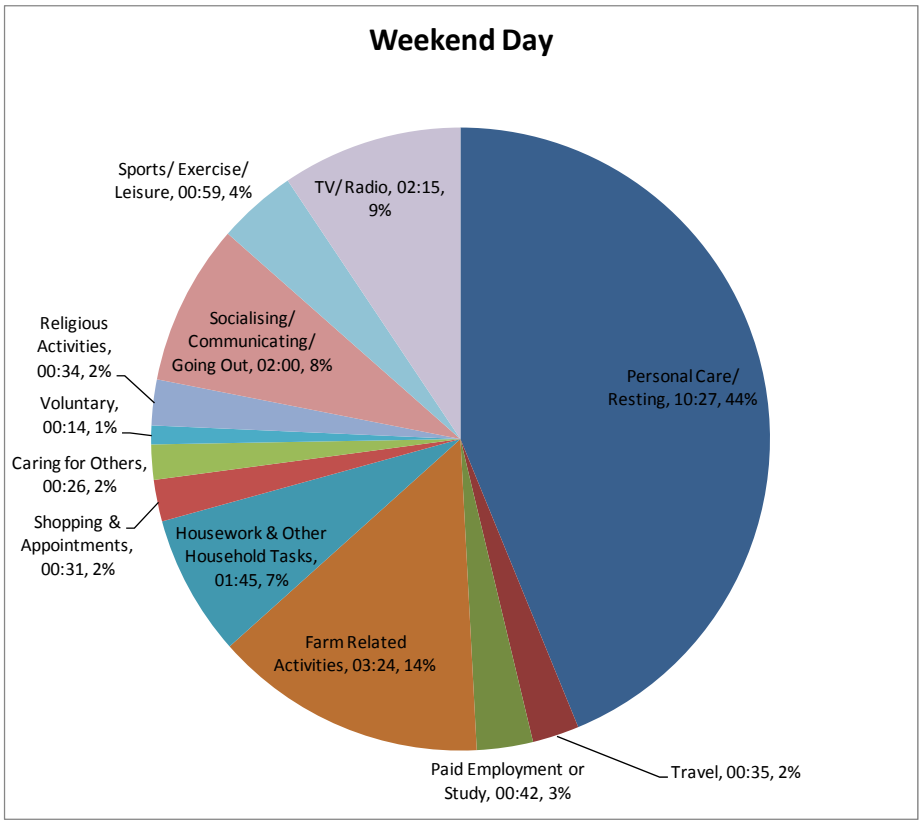
In considering time use patterns, it is important to distinguish between weekdays and weekend days. This is because the proportion of respondents involved in certain activities differs considerably between weekdays and weekend days. For example, all respondents did some form of personal care, slept or rested on weekdays and weekend days, though the proportion of respondents that recorded doing any paid employment on weekend days is less than a third of the proportion of respondents that recorded working in paid employment on weekdays. Only five percent of farm household members reported helping other households' informally on weekend days, though twelve percent reported that they helped other households informally on weekdays. There is a five-fold increase in the number of respondents engaging in religious activities on weekend days compared to weekdays. The number of farm household members eating and going out on weekend days more than tripled from nine percent on weekdays to thirty one percent on weekend days. There is also a four-fold increase in the proportion of respondents that attend sports related activities on weekend days compared to weekdays.

As specified in Section 4.2.10, the classification of activities in the time use diaries includes twelve activity groups and thirty activity codes. Average time spent participating in each of these activities also varies considerably between weekdays and weekend days. Figure 6-1 presents a graphical comparison of time use in each of the twelve activity groups across weekdays and weekend days. The charts show the proportion of the day and the average time spent in each of the twelve activity groups for a weekday and a weekend day. Respondents spend three percent more time on personal care and resting on weekend days than on weekdays (10 hours 27 minutes compared to 9 hours 52 minutes). Over two and a half hours or eleven percent of the day is spent on paid employment or study and education on an average weekday, decreasing to just forty two minutes or three percent on weekend days. The time allocated to travel on weekdays and weekend days remains more or less the same on weekdays and weekend days.

Farm related activities account for an average of eighteen percent of respondent's weekdays and fourteen percent of their weekend days. Time spent on household and other domestic related tasks decreases by less than ten minutes on weekend days, while the proportion of the day that is spent doing housework and other household tasks on weekend days decreases by just one percent compared to weekdays. The proportion of the day that respondents spend shopping and running errands, caring for others and doing voluntary activities does not change significantly between weekdays and weekend days. Time allocated to religious activities increases from an average of four minutes on weekdays to thirty four minutes on weekend days, while the proportion of respondents that participate in religious increases by just one percent on weekend days. The proportion of the day spent socialising, going out and on sports, exercise and leisure more than doubles on weekend days compared to weekdays. With regard to watching television, listening to the radio and reading, just thirteen minutes more are allocated to these activities on weekend days compared to weekdays representing a one percent increase in the proportion of the average day that is allocated to these activities on weekend days.

Figure 6-1 Average Daily Duration in Primary Activities Across Weekdays and Weekend Days





Following this overview of time allocation by activity group, the sub-sections that follow present a more detailed analysis of the patterns of time use of farm household members by activity code. The basic structure of the allocation of time by farm household members across gender is shown in Tables 6-1 and 6-2 and the emerging patterns discussed here and in 6.4. More specifically, Table 6-1 presents the average times (expressed as hh:mm/day) spent on each of the thirty primary activities across the total survey population. The reported averages in this table include the respondents in the survey population regardless of whether they participated in the activity or not. Also included in Table 6-1 are the results of the comparisons across gender using the Mann-Whitney U test. The significance levels were set at $p<0.1$, $p<0.05$ and $p<0.01$ for this analysis. The average time spent on any activity across the survey population is a function of both the amount of time individuals spend doing each activity and the proportion of those people who engage in each activity. Table 6-2 therefore presents the proportion of the total survey population that participated in each of the thirty activities as a compliment to Table 6-1. Table 6-2 also reports the average time (expressed as hh:mm/day) spent on each primary activity by the 'doers' or those that participated in the activity. Results for weekday and weekend day time use are presented separately in both tables as these vary considerably.

It should be noted that Sections 6.3 and 6.4 also make tentative comparisons between the time use of farm household members in the West of Ireland (as of 2011/12) and the time use of the general population in Ireland at the national level (as of 2005). This was done by accessing the micro-data from the Irish National Time Use Survey 2005 (ESRI, 2005) via the Irish Social Science Data Archive (ISSDA). The data was then edited, coded and analysed before Wilcoxon signed-rank tests were used to test for the existence of significant statistical relationships between variables from the two datasets.

Table 6-1 Average Daily Duration (hh:mm) of Activities by Gender

Activity Group	Activity	WEEKDAY				WEEKEND DAY			
		All Persons	Men	Women	Comparison	All Persons	Men	Women	Comparison
Personal Care/ Resting	Personal Care/ Resting/ Sleeping	09:52	09:46	10:04	ns	10:27	10:22	10:38	ns
Travel	Travel	00:35	00:32	00:41	ns	00:35	00:35	00:34	ns
Paid Employment or Study	Paid Employment	02:06	02:16	01:48	ns	00:20	00:23	00:16	ns
	Study/ Education	00:01	00:01	00:00	ns	00:00	**00:00**	**00:01**	Women > Men **
	Breaks from Work/ Study	00:26	**00:31**	**00:16**	Men > Women ***	00:21	**00:27**	**00:10**	Men > Women ***
Farm Related Activities	Planting/ Harvesting/ Picking/ Weeding	00:24	**00:31**	**00:10**	Men > Women ***	00:17	00:24	00:03	ns
	Farming of Animals	02:38	**03:32**	**00:54**	Men > Women ***	02:18	**03:06**	**00:45**	Men > Women ***
	Farm Maintenance	01:03	**01:34**	**00:05**	Men > Women ***	00:41	**01:00**	**00:03**	Men > Women ***
	Administration Related to Farming	00:11	**00:12**	**00:09**	Men > Women **	00:06	**00:07**	**00:03**	Men > Women **
	Non-Paid Activities Related to Farming	00:01	00:01	00:01	ns	00:02	00:02	00:02	ns
Housework & Other Household Tasks	Cooking & Food Preparation	00:47	**00:21**	**01:36**	Women > Men ***	00:59	**00:28**	**01:57**	Women > Men ***
	Housework	00:46	**00:10**	**01:56**	Women > Men ***	00:33	**00:10**	**01:18**	Women > Men ***
	Other Domestic Work inc. DIY, House Repairs etc.	00:21	**00:14**	**00:36**	Women > Men ***	00:13	00:20	00:17	ns
Shopping & Appointments	Shopping/ Errands/ Appointments	00:26	**00:17**	**00:43**	Women > Men ***	00:31	**00:20**	**00:53**	Women > Men ***
Caring for Others	Childcare	00:19	**00:08**	**00:39**	Women > Men ***	00:16	**00:06**	**00:35**	Women > Men **
	Caring for Adults	00:15	**00:09**	**00:27**	Women > Men *	00:10	00:08	00:15	ns
Voluntary	Civic Activities	00:09	00:10	00:06	ns	00:11	00:12	00:10	ns
	Informal Help to Other Households	00:11	00:14	00:07	ns	00:03	00:02	00:04	ns
Religious Activities	Religious Activity	00:04	**00:03**	**00:07**	Women > Men *	00:34	00:33	00:38	ns
Socialising/ Communicating/ Going Out	Spending Time/ Chatting with Family/ Friends/ Neighbours	00:38	00:36	00:42	ns	01:01	00:58	01:08	ns
	Phoning/ Texting/ Family, Friends or Neighbours	00:08	**00:06**	**00:12**	Women > Men ***	00:08	**00:06**	**00:12**	Women > Men ***
	Eating Out/ Going Out	00:11	00:13	00:07	ns	00:51	**01:04**	**00:27**	Men > Women ***
Sports/ Exercise/ Leisure	Playing Sports/ Physical Exercise	00:12	**00:10**	**00:16**	Women > Men **	00:13	**00:09**	**00:22**	Women > Men ***
	Productive Exercise	00:01	**00:01**	**00:01**	Women > Men *	00:02	00:02	00:03	ns
	Attending Sports Related Activities	00:03	00:03	00:04	ns	00:22	00:28	00:11	ns
	Computer/ Internet for Personal Use	00:05	00:05	00:07	ns	00:06	**00:04**	**00:09**	Women > Men *
	Hobbies/ Other Leisure Activities	00:03	00:03	00:04	ns	00:16	**00:13**	**00:21**	Women > Men *
TV/ Radio	Watching TV/ Listening to the Radio	01:38	01:42	01:32	ns	01:48	01:49	01:46	ns
	Reading	00:24	**00:20**	**00:31**	Women > Men *	00:27	**00:20**	**00:40**	Women > Men ***
Other	Other	00:01	00:00	00:03	ns	00:01	00:00	00:01	ns

Note. ns = not significant. Comparisons in bold are significantly different at * p<0.1, ** p<0.05 & *** p<0.01

Table 6-2 Average Daily Duration (hh:mm) of Activities by Participants or 'Doers' and Participation Rate

Activity Group	Activity	WEEKDAY			WEEKEND DAY		
		All Persons (n=261)	Men (n=172)	Women (n=89)	All Persons (n=259)	Men (n=171)	Women (n=88)
Personal Care/ Resting	Personal Care/ Resting/ Sleeping	09:52 (100%)	09:46 (100%)	10:04 (100%)	10:27 (100%)	10:22 (100%)	10:38 (100%)
Travel	Travel	00:35 (51%)	00:32 (49%)	00:41 (54%)	00:35 (40%)	00:35 (39%)	00:34 (42%)
Paid Employment or Study	Paid Employment	02:06 (30%)	02:16 (31%)	01:48 (28%)	00:20 (6%)	00:23 (7%)	00:16 (5%)
	Study/ Education	00:01 (1%)	00:01 (2%)	00:00 (0%)	00:00 (1%)	00:00 (0%)	00:01 (2%)
	Breaks from Work/ Study	00:26 (37%)	00:31 (43%)	00:16 (25%)	00:21 (24%)	00:27 (29%)	00:10 (14%)
Farm Related Activities	Planting/ Harvesting/ Picking/ Weeding	00:24 (15%)	00:31 (20%)	00:10 (7%)	00:17 (9%)	00:24 (11%)	00:03 (6%)
	Farming of Animals	02:38 (74%)	03:32 (95%)	00:54 (33%)	02:18 (70%)	03:06 (93%)	00:45 (26%)
	Farm Maintenance	01:03 (40%)	01:34 (58%)	00:05 (6%)	00:41 (23%)	01:00 (32%)	00:03 (6%)
	Administration Related to Farming	00:11 (21%)	00:12 (24%)	00:09 (15%)	00:06 (9%)	00:07 (12%)	00:03 (3%)
	Non-Paid Activities Related to Farming	00:01 (3%)	00:01 (2%)	00:01 (3%)	00:02 (3%)	00:02 (3%)	00:02 (2%)
Housework & Other Household Tasks	Cooking & Food Preparation	00:47 (48%)	00:21 (31%)	01:36 (80%)	00:59 (50%)	00:28 (33%)	01:57 (83%)
	Housework	00:46 (41%)	00:10 (17%)	01:56 (85%)	00:33 (32%)	00:10 (14%)	01:18 (68%)
	Other Domestic Work inc. DIY, House Repairs etc.	00:21 (26%)	00:14 (19%)	00:36 (39%)	00:13 (23%)	00:20 (24%)	00:17 (20%)
Shopping & Appointment	Shopping/ Errands/ Appointments	00:26 (37%)	00:17 (29%)	00:43 (53%)	00:31 (36%)	00:20 (25%)	00:53 (57%)
Caring for Others	Childcare	00:19 (13%)	00:08 (9%)	00:39 (20%)	00:16 (8%)	00:06 (5%)	00:35 (14%)
	Caring for Adults	00:15 (11%)	00:09 (8%)	00:27 (16%)	00:10 (8%)	00:08 (8%)	00:15 (9%)
Voluntary	Civic Activities	00:09 (8%)	00:10 (8%)	00:06 (7%)	00:11 (7%)	00:12 (8%)	00:10 (6%)
	Informal Help to Other Households	00:11 (12%)	00:14 (15%)	00:07 (8%)	00:03 (5%)	00:02 (5%)	00:04 (5%)
Religious Activities	Religious Activity	00:04 (7%)	00:03 (5%)	00:07 (11%)	00:34 (51%)	00:33 (49%)	00:38 (55%)
Socialising/ Communicating/ Going Out	Spending Time/ Chatting with Family/ Friends/ Neighbours	00:38 (46%)	00:36 (47%)	00:42 (44%)	01:01 (52%)	00:58 (53%)	01:08 (51%)
	Phoning/ Texting/ Family, Friends or Neighbours	00:08 (17%)	00:06 (10%)	00:12 (30%)	00:08 (16%)	00:06 (12%)	00:12 (25%)
	Eating Out/ Going Out	00:11 (9%)	00:13 (10%)	00:07 (7%)	00:51 (31%)	01:04 (37%)	00:27 (17%)
Sports/ Exercise/ Leisure	Playing Sports/ Physical Exercise	00:12 (16%)	00:10 (12%)	00:16 (22%)	00:13 (15%)	00:09 (9%)	00:22 (25%)
	Productive Exercise	00:01 (2%)	00:01 (1%)	00:01 (3%)	00:02 (2%)	00:02 (2%)	00:03 (3%)
	Attending Sports Related Activities	00:03 (3%)	00:03 (3%)	00:04 (2%)	00:22 (12%)	00:28 (15%)	00:11 (8%)
	Computer/ Internet for Personal Use	00:05 (10%)	00:05 (9%)	00:07 (11%)	00:06 (8%)	00:04 (6%)	00:09 (13%)
	Hobbies/ Other Leisure Activities	00:03 (7%)	00:03 (6%)	00:04 (7%)	00:16 (13%)	00:13 (11%)	00:21 (18%)
TV/ Radio	Watching TV/ Listening to the Radio	01:38 (80%)	01:42 (84%)	01:32 (74%)	01:48 (74%)	01:49 (73%)	01:46 (76%)
	Reading	00:24 (35%)	00:20 (32%)	00:31 (42%)	00:27 (36%)	00:20 (30%)	00:40 (47%)
Other	Other	00:01 (1%)	00:00 (0%)	00:03 (2%)	00:01 (1%)	00:00 (1%)	00:01 (1%)

6.3.2 Personal Care, Sleeping, Travel & Paid Employment

Looking firstly at the average time spent on each primary activity across the total survey population (Table 6-1), the most time consuming activities on weekdays and on weekend days are personal care, resting and sleeping (9 hours 52 minutes on weekdays, 10 hours 27 minutes on weekend days). Activities such as personal care, eating, sleeping and resting are recorded by all respondents (Table 6-2).

Fifty one percent of farm household members do some form of travelling on weekdays and a smaller proportion, just forty percent travel on weekend days. These figures are significantly ($p<0.01$) lower than the seventy four percent of the national population that travel on weekdays and the sixty six percent that travel on weekend days (ESRI, 2005). Farm household members also spend less time, on average, travelling than the average person in Ireland. Farm household members spend an average of 35 minutes travelling on weekdays and weekend days. This is also significantly ($p<0.01$) lower than the 1 hour and 15 minutes that members of the general population spend travelling on weekdays and 1 hour 6 minutes the average person in Ireland spends travelling on weekend days (ESRI, 2005).

Paid employment (2 hours 6 minutes) is the third most time consuming activity for farm household members on weekdays but respondents only spend an average of twenty minutes in paid employment on weekend days. This is significantly ($p<0.01$) lower than the 3 hours and 44 minutes the average person in Ireland spends in paid employment on weekdays and 1 hour and 18 minutes on weekend days (ESRI, 2005). This variation may be attributed to the significantly ($p<0.01$) lower proportion of the sample of farm household members that participate in paid employment on weekdays (30%) and on weekend days (6%), compared to fifty five percent and twenty three percent of the whole population that partake in paid employment on weekdays and on weekend days (ESRI, 2005).

The activities that the smallest proportion of respondents participate in on weekdays and on weekend days are studying and education. Less than one percent of farm household members reported studying or being involved in education on weekdays or on weekend days. This is significantly ($p<0.01$) low when compared to the data from the Irish National Time

Use Survey 2005 (ESRI, 2005), where thirteen percent reported doing some form of study or education on weekdays and 6% on weekend days. There is also significant ($p<0.01$) variation in the time that farm household members and members of the general population spend participating in educational activities on weekdays and on weekend days.

6.3.3 Farm Related Activities

Of the respondents in the dataset, seventy seven percent took part in some kind of farm related activity on weekdays, while seventy five percent of respondents did some form of farm related activity on weekend days. Respondents spent the most time farming animals (2 hours 38 minutes on weekdays, 2 hours 18 minutes on weekend days), followed by farm maintenance (1 hour 3 minutes on weekdays, 41 minutes on weekend days) and planting and harvesting (24 minutes on weekdays, 17 minutes on weekend days). The smallest proportion of respondents, three percent, did non-paid activities related to farming such as attending meetings run by agricultural organisations. They spent an average of only 2 minutes on weekdays and on weekend days attending farm related meetings. Administration related to farming, such as completing forms for the single payment scheme, REPS, AEOS, etc. took an average of 11 minutes on weekdays and 6 minutes on weekend days, with twenty one percent of respondents doing some paperwork on weekdays and a smaller proportion, twelve percent, on weekend days. As this is the first time that a time use study in Ireland has been used to measure the time allocated to farming related activities, there is no data with which to compare these results.

6.3.4 Housework, Other Domestic Work, Shopping and Appointments

Comparing the results of the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey* with those from the Irish National Time Use Survey 2005 (ESRI, 2005), time spent on housework and other domestic tasks by farm household members are broadly in line with those of the national population. While the surveys present almost identical results, the time use estimates from the national population are from 2005, and so, the following comparisons should be treated with caution.

The proportions of farm household members and the national population who cook and prepare food are not statistically different with between forty eight percent and fifty percent partaking in such activities on weekdays and on weekend days. The average time spent cooking is moderately different. Farm household members spend 47 minutes cooking and preparing food on weekdays and 12 minutes longer on weekend days, compared to the national average of 39 minutes on both weekdays and weekend days (ESRI, 2005). These results are significantly different for weekend days only ($p<0.01$). The proportion of farm household members that do housework is significantly ($p<0.01$) smaller than the national average with just forty one percent doing housework on weekdays and thirty two percent on weekend days, compared to forty six percent of the national population on weekdays and forty four percent on weekend days. The average time that farm household members spend doing housework, including cleaning, is similar to that of the rest of the population. Farm household members spend, on average, 46 minutes on weekdays and 33 minutes on weekend days doing housework, compared to 41 minutes on weekdays and 39 minutes on weekend days that the national population spend doing housework (ESRI, 2005). These results are significantly different ($p<0.05$) for weekdays and weekend days.

A similar pattern emerges when comparing the proportion of farm household members and members of the population as a whole that do some kind of domestic work such as DIY or house repairs. Twenty six percent of farm household members do some form of domestic work, other than housework, on weekdays with twenty three percent reporting participation in domestic work on weekend days. Similar proportions of the entire population partake in some form of domestic work on weekdays and on weekend days though the participation rate is significantly ($p<0.05$) different on weekdays. Members of the national population spend longer than farm household members doing such activities, 3 minutes longer on weekdays and 17 minutes longer on weekend days though, differences in time spent doing domestic work across the two samples are not statistically different (ESRI, 2005). Between thirty four percent and thirty seven percent of farm household members and the national population shop or run errands on weekdays and on weekend days. Both samples of respondents spend 26 minutes on shopping and running errands on weekdays and members of the entire population spend only 3 minutes more than farm household members shopping and running errands on weekend days, though this is not a statistically significant difference

6.3.5 Caring for Others

There is a substantial difference between the proportion of and the average time farm household members and the national population spend caring for children and adults. On weekdays, just thirteen percent of farm household members do some form of childcare compared to twenty five percent of the national population (ESRI, 2005). The results are similar and significantly different ($p<0.01$) for weekend days, with just eight percent of farm household members recording any childcare activities compared to twenty five percent of the national population. These results are reflected in the average times that farm household members spend caring for children compared to the average person in Ireland. Farm household members allocate 19 minutes on weekdays and 16 minutes on weekend days to childcare compared to the 37 minutes on weekdays and 30 minutes on weekend days that the average person in Ireland spends on childcare (ESRI, 2005). The differences in time allocated to childcare between the two samples are statistically significant ($p<0.01$) for both weekdays and weekend days, though this is not surprising given the very different age structures and household characteristics of the two groups.

Comparing the proportion of and the average time spent caring for adults across farm household members and the national population, the results are the opposite of those for childcare. A significantly ($p<0.01$) larger proportion of farm household members care for adults on weekdays (eleven percent) and on weekend days (eight percent), compared to the six percent of those in the entire population that care for adults on weekdays and on weekend days (ESRI, 2005). Farm household members spend more than twice as long, 15 minutes compared to 7 minutes, caring for adults on weekdays than the average person in Ireland in 2005, though these results are not significantly different. On weekend days, farm household members spend just 3 minutes longer than the average person caring for adults (ESRI, 2005). The most likely reason for farm household members spending more time caring for the elderly is that traditionally in rural Ireland, the elderly are cared for by their extended families within their home (Tara Winthrop Private Clinic, 2004; Barry and Conlon, 2010).

6.3.6 Voluntary & Religious Activities

Eight percent of farm household members reported being engaged in civic related activities on weekdays while seven percent said they were engaged civically on weekend days. Farm household members spend an average of 9 minutes on weekdays and 11 minutes on weekend days engaged in civic related activities. A larger proportion of the sample, twelve percent, reported helping other households informally on weekdays compared to five percent on weekend days. Consequently, the average time allocated to informally helping other households was 11 minutes on weekdays and just 3 minutes on weekend days. Looking at volunteering as a whole, nineteen percent of farm household members reported volunteering (partaking in either civic activities or informally helping to other households) on a weekday, while eleven percent reported doing either civic related activities or informally helping other households on weekend days. Comparing farm household members participation in and the number of hours dedicated to volunteering with the data from the nationally representative Irish National Time Use Survey (ESRI, 2005), there is a substantiative statistically significant ($p<0.01$) difference in the proportions of respondents that partake in volunteering across the two samples. Only seven percent of the population of Ireland recorded any participation in voluntary activities on weekdays and just six percent were involved in volunteering on weekend days. Respondents of the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey* spend an average of 20 minutes per day (weekday) doing voluntary activities compared to the 8 minutes that the respondents of the Irish National Time Use Survey 2005 (ESRI, 2005) spend doing voluntary activities. A similar pattern emerges at the weekend with farm household members spending 6 minutes longer doing voluntary activities on weekend days compared to respondents from the Irish National Time Use Survey 2005 (ESRI, 2005). The differences in time spent on voluntary activities across the two samples are statistically significant ($p<0.01$).

In summary, almost three times as many farm household members participate in voluntary activities on weekdays and almost twice the proportion on weekend days when compared to the national population. With regard to the length of time they spend volunteering, farm household members spend more than twice as long doing voluntary activities on weekdays and on weekend days when compared to the national population. However, the

interpretation of these results should be treated with caution as the differences in time use could be somewhat attributed to the inclusion of an 'informal help to other households' activity code in the Time Use of Farm Household Member in the West of Ireland 2011/12 survey. It should also be noted that unemployment in Ireland was 4.3% in 2005 and that Ireland entered into an economic recession in 2009, so at the time that farm household members were surveyed (2011/12) the unemployment rate had risen to approximately 14.5% (CSO, 2012c). Thus, a plausible explanation for farm household members spending more time volunteering could be that some of the respondents were unemployed at the time of the survey and therefore had more free time available to them when compared to the national averages from the Irish National Time Use Survey 2005 (ESRI, 2005).

In relation to religious activities, there is a significant large increase (forty four percent) in the proportion of the survey population involved in religious activity on weekend days compared to weekdays. This leads to a 30 minute increase in the average time spent doing religious activities on weekend days compared to weekdays. The proportion of the national population that partake in religious activities on weekdays is three percent more than the proportion of farm household members ($p<0.01$) though on weekend days just over half of the farm household members surveyed recorded doing some religious activity compared to thirty percent of the entire population of Ireland ($p<0.01$). On weekend days the average person in Ireland spends significantly ($p<0.01$) less time (15 minutes) than farm household members from the West of Ireland doing religious activities (ESRI, 2005). A plausible explanation for the higher proportion of farm household members attending religious based activities is that people living in rural Ireland view going to church at the weekend as a social outing and therefore a higher proportion attend mass. It also probably reflects the older age structure of the sample.

6.3.7 Socialising, Communicating & Going Out

A significantly higher proportion of farm household members in the West of Ireland chat and spend time with family, friends and neighbours compared to members of the general population (ESRI, 2005). This is true for both weekdays ($p<0.05$) and weekend days ($p<0.1$). Even though a larger proportion of farm household members chat and spend time with

family, friends and neighbours, farm household members spend the same amount of time on this activity (38 minutes) on weekdays and just three minutes longer (61 minutes) on weekend days when compared to the average person in Ireland (ESRI, 2005). The opposite is true for phoning and texting friends and neighbours, where a significantly ($p<0.01$) larger proportion of the national population partake in such activities on weekdays and weekend days compared to farm household members. There is little variation in time spent phoning and texting between the two groups though, with farm household members and members of the national population spending an average of eight minutes on this activity on weekdays and members of the general population just eleven minutes more on weekend days ($p<0.1$).

Altogether a significantly ($p<0.01$) larger proportion of the national population socialise, communicate or go out on weekdays than farm household members in the West of Ireland. Sixty percent of the general population of Ireland partake in these activities on weekdays compared to fifty five percent of farm household members. These proportions converge and are not significantly different on weekend days when seventy three percent of the national population partake in socialising, communicating or going out compared to seventy one percent of farm household members. Farm household members spend 57 minutes socialising, communicating and going out on weekdays compared to the 65 minutes that the average person in Ireland spends socialising, communicating and going out on weekdays (ESRI, 2005). A similar picture emerges for weekend days with the average person in Ireland spending 2 hours 27 minutes socialising, communicating and going out (ESRI, 2005) compared to the 2 hours that farm household members spend doing the same activities. To summarise, farm household members are significantly more likely to chat and communicate informally than the average person in Ireland but members of the national population are significantly more likely to phone and text than farm household members, though each sample spend roughly the same amount of time on both activities.

6.3.8 Sports, Exercise & Leisure

Farm household members are more likely to play sports, exercise and attend sports related activities on weekend days (twenty seven percent) than on weekdays when just twenty percent participate in these activities. In line with this the average time allocated to playing

sports, exercising and attending sports related activities increases to 37 minutes on weekend days, from 16 minutes on weekdays. A similar pattern emerges when the time use of the average person in Ireland with respect to sports and exercise is analysed. Twenty six percent of the population of Ireland partake in sports and exercise related activities on weekdays and on weekend days, spending an average of 19 minutes doing so. This increases to 28 minutes on weekend days with an increase of five percent in the proportion of people partaking in sports and exercise on weekend days (ESRI, 2005). In summary, a significantly ($p<0.01$) larger proportion of the national population participate in sports, exercise and sports related activities on weekdays but one percent more farm household members than the general population participate on weekend days.

A larger proportion of farm household members play sports and get physical exercise (sixteen percent on weekdays, fifteen percent on weekend days) than do productive exercise (two percent on weekdays and on weekend days), attend sports related activities (three percent on weekdays, twelve percent on weekend days), use the computer (ten percent on weekdays, 8% on weekend days), or spend time on their hobby (seven percent on weekdays, thirteen percent weekend days). This is true for weekdays and weekends days. Consequently, most of the 24 minutes that farm household members allocate to sports, exercise, computer usage and hobbies on weekdays is spent playing sports, though on weekend days they spend the largest proportion of their sports, exercise and leisure time (22 minutes) attending sports related activities.

Focusing on time spent on computer usage and hobbies, the proportions of respondents to the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey* and the Irish National Time Use Survey 2005 that use the computer for personal use decrease on weekend days, though the average time spent using the computer increases on weekend days (ESRI, 2005). The only significant ($p<0.1$) difference in time allocated to computer or internet use across the two samples is on weekdays when members of the general population spend 2 minutes longer than farm household members on this activity. The proportion of both farm household members and members of the national population doing hobbies and partaking in other leisure activities increases on weekend days (ESRI, 2005). In line with

this, the time allocated to hobbies and participation in other leisure activities increases on weekend days for both farm household members and members of the entire population.

6.3.9 TV , Radio and Reading

Eighty percent of farm household members watch television or listen to the radio on weekdays compared to seventy four percent on weekend days. Watching television and listening to the radio occupies 1 hour and 38 minutes of farm household member's time on weekdays and just 10 minutes more on weekend days. Almost the same proportion of farm household members, thirty five percent, read on weekdays and on weekend days, though they spend approximately 8 minutes longer reading on weekend days than they do on weekdays. In order to compare the data from the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey* to the data from the Irish National Time Use Survey 2005 (ESRI, 2005), proportions and time allocated to watching television, listening to the radio and reading must be aggregated into one activity group. The reason is that watching television and listening to the radio are aggregated in one activity code in the Farm Household Members Survey and reading and listening to the radio are aggregated into one activity code in the Irish National Time Use Survey. Therefore the results are not directly comparable.

On weekdays and weekend days a significantly ($p<0.01$) larger proportion of farm household members allocate time to watching television, listening to the radio or reading than members of the national population (ESRI, 2005). On weekdays, eighty five percent of farm household members watch television, listen to the radio or read compared to seventy five percent of the national population. On weekend days, six percent more farm household members watch television, listen to the radio or read than the national population (ESRI, 2005). Farm household members spend 2 hours and 2 minutes watching television, listening to the radio and reading on weekdays compared to 2 hours and fifteen minute on weekend days. This is slightly more than the 1 hour and 54 minutes that the average person in the entire population spends doing the same activities on weekdays and 2 hours on weekend days (ESRI, 2005).

6.4 Time Use Patterns and Gender

This section presents a more detailed analysis of the results in Tables 6-1 and 6-2, providing a comparison of the proportion of and the average time spent doing each of the thirty activities by gender for weekdays and weekend days. As reported in Section 6.2.2, differences in time use across gender were calculated using the Mann-Whitney U test. The levels of significance were set at $p<0.1$, $p<0.05$ and $p<0.01$ for this analysis.

6.4.1 Personal Care/Sleeping

There are interesting gender patterns across a range of activities. For commonly recorded activities that are necessary in order to function, such as personal care and sleeping, the same proportion of women and men do these activities on weekdays and weekend days. With respect to the allocation of time, however, Table 6-1 shows that across the survey sample females spend 18 minutes more than males on weekdays and 16 minutes more than males on weekend days on personal care, resting and sleeping. Time spent on personal care and sleeping was not statistically different between the sexes however.

6.4.2 Travel

On weekdays and weekend days, a greater proportion of women than men allocate time to travel. Fifty four percent of women reported doing some form of travelling during the week and forty two percent on weekend days, compared to forty nine percent of men on weekdays and thirty nine percent of men on weekend days. On weekdays women spend 9 minute longer than men travelling but on weekend days men spend 1 minute more than women travelling. Again however, the differences are not statistically significant for weekdays or weekend days.

6.4.3 Paid Employment or Study

A larger proportion of men than women (three percent more on weekdays and two percent more on weekend days) partake in paid employment. Thus, time allocated to paid employment is higher for men than for women, though the differences are not statistically significant. This is true for both weekdays and weekend days. On weekdays men spend 28 minutes longer in paid employment and on weekend days men allocate 7 minutes longer to paid employment. There is a very small participation rate (one percent) in study and education across the survey sample which explains why just two percent of men and no women partake in study and education on weekdays. Conversely two percent of women partake in study and education on weekend days while no men recorded any participation in study or education on weekend days. The average time allocated to studying or education is therefore negligible, though women allocate significantly ($p<0.05$) more time than men to study and education on weekend days. Time allocated to study or education on weekdays is not statistically significant across the sexes.

Looking at the participation rates in breaks from work or study, forty three percent of men take breaks from work or study on weekdays compared to twenty five percent of women. On weekend days twenty nine percent of men take breaks from work or study compared to fourteen percent of women. There is a significant difference in time allocated to breaks from work or study across the sexes. Men spend significantly ($p<0.01$) more time than women taking breaks from work or study during the week (15 minutes more) and on weekend days (17 minutes more).

6.4.4 Farm Related Activities

The proportions of men and women participating in farm related activities varies substantially. Ninety seven percent of men engage in one or more farm related activities on weekdays compared to sixty one percent of women. On weekend days ninety six percent of men compared to only thirty three percent of women engaged in one or more farm related activity. Larger proportions of men than women allocate time to planting, harvesting, picking and weeding, farming of animals, farm maintenance and administration related to

farming on weekdays and weekend days. Twice the proportion of men than women participate in planting and harvesting, three times the proportion of men than women allocate time to farming animals and more then five times the proportion of men than women do farm maintenance on weekdays and weekend days. A larger proportion of women than men participate in non-paid activities related to farming on weekdays though more men allocate time to non-paid activities related to farming on weekend days.

Men allocate significantly more time than women to nearly all farm related activities on weekdays and weekend days with the exception of farming activities that do not directly provide an income, such as attending meetings organised by agricultural organisations. Men allocate significantly more time than women to planting, harvesting, picking and weeding ($p<0.01$), the farming of animals ($p<0.01$), farm maintenance ($p<0.01$) and administration related to farming ($p<0.05$) on weekdays. On weekend days men allocate significantly more time than women to the farming of animals ($p<0.01$), farm maintenance ($p<0.01$) and administration related to farming ($p<0.05$). Men spend 4 hours and 31 minutes more than women doing farm related activities during the week and 3 hours and 43 minutes more than women on weekend days.

6.4.5 Housework and Other Household Tasks/ Shopping and Errands

In contrast to farm work, a larger proportion of women than men do some form of cooking, housework or other household task on weekdays and weekend days. Ninety two percent of women and forty seven percent of men recorded doing some form of housework or household activity on weekdays, while on weekend days ninety percent of women and forty four percent of men do a housework or household related activity. Overall, women spend an average of 4 hours and 8 minutes doing housework and household related activities on weekdays compared to men who spend 45 minutes doing the same activities. On weekend days women spend 3 hours and 32 minutes on housework and household related activities compared to men who spend approximately 58 minutes doing housework and household related activities.

Just over a quarter of men recorded cooking on a weekday compared to just over three quarters of women. The proportion of men and women allocating time to cooking on weekend days are similar to those on weekdays. More than four times the number of women than men do housework on weekdays and on weekend days. With regard to other domestic work such as DIY, house repairs or maintenance, twice as many women allocate time to these activities on weekdays, though four percent more men than women allocate time to other domestic chores on weekend days. Women spend significantly ($p<0.01$) more time than men cooking and on food preparation on weekdays and weekend days. Women also spend significantly ($p<0.01$) more time doing housework such as cleaning on weekdays and weekend days (1 hour 46minutes on weekdays, 1 hour 8 minutes on weekend days). On weekdays women spend significantly ($p<0.01$) more time than men doing work such as DIY, house repairs or maintenance but on weekend days men spend more time than women on these activities though, the difference is not statistically significant.

Fifty three percent of women allocate time to running errands, shopping and attending appointments on weekdays compared to thirty seven percent of men. On weekend days fifty seven percent of women run errands, shop or attend appointments compared to twenty five percent of men. As expected, given the differences in proportions, women spend significantly ($p<0.01$) longer than men running errands, shopping and attending appointments on weekdays and weekend days. Women spend 43 minutes running errands, shopping and attending appointments on weekdays compared to the seventeen minutes men spend doing the same activities. On weekend days women spend fifty three minutes running errands, shopping and attending appointments compared to the twenty minutes men spend running errands, shopping and attending appointments.

6.4.6 Caring for Others

More than twice as many women than men allocate time to childcare and caring for adults on weekdays. On weekend days almost three times as many women than men participate in childcare but one percent more men than women care for adults on weekend days. On average, females allocate more time than men on childcare and caring for adults on weekdays and weekend days. On weekdays women spend approximately 31 minutes longer

then their male counterparts on childcare ($p<0.01$) and 18 minutes longer caring for adults ($p<0.1$). Women also spend 29 minutes more on childcare and 7 minutes more looking after adults on weekend days. The difference in the average time allocated to childcare on weekend days across gender is significant at the 5 percent level but the difference in time allocated to caring for adults on weekend days in not statistically significant.

6.4.7 Voluntary Activities

Eight percent of men from farm households partake in civic related activities on weekdays and on weekend days compared to seven percent of women on week days and six percent of women weekend days. The difference in the time spent participating in civic related activities across the sexes is not statistically significant, though men spend 4 minutes more than women partaking in civic related activities on weekdays and 2 minutes more on weekend days. On weekdays fifteen percent of men reported helping other households informally but on weekend days this decreased to just five percent. A smaller proportion of women, eight percent, reported helping other households informally on weekdays and this figure also decreased to five percent on weekend days. Men spend an average of 14 minutes helping other households informally on weekdays compared to women who spend 7 minutes helping other households informally. On weekend days women spend 2 minutes longer than men helping other households informally. The variations in average time allocated to helping other households informally across gender are not statistically significant for weekdays or weekend days.

Examining the proportion of men and women that do any volunteering at all, either civic engagement or helping other households informally, twenty two percent of men volunteer on weekdays compared to fifteen percent of women who volunteer on weekdays. These are significantly ($p<0.01$) larger than the proportions of men and women from the national population who participate in any voluntary activities on weekdays. Across the population of Ireland six percent of men and seven percent of women volunteer on weekdays. Twelve percent of men do some form of voluntary activity on weekdays compared to nine percent of women who volunteer on weekend days. Comparing these results to the Irish National Time Use Survey 2005, a significantly ($p<0.01$) higher proportion of men from farm

households compared to the general population allocate time (four percent more) to voluntary activities on weekend days while five percent more women from farm households allocate time to voluntary activities on weekend days (ESRI, 2005).

Men from farm households spend 24 minutes volunteering on weekdays but only 14 minutes volunteering on weekend days, while women spend 13 minutes volunteering on weekdays and 14 minutes volunteering on weekend days. Comparing these results to those from the Irish National Time Use Survey 2005 (ESRI, 2005), we see that men from farm households spend 17 minutes longer volunteering on weekdays ($p<0.01$) and 5 minutes longer volunteering on weekend days compared to the average man in Ireland. Women from farm households spend 5 minutes longer ($p<0.01$) volunteering on weekdays and 8 minutes longer ($p<0.01$) volunteering on weekend days compared to the average woman in Ireland. The aforementioned caveats in relation to the comparisons across the two datasets still apply however.

6.4.8 Religious Activity

Twice as many women than men participate in religious activities on weekdays. On weekend days six percent more women than men participate in religious activities. Women spend significantly ($p<0.1$) more time (4 minutes more) than men participating in religious activities on weekdays. Women allocate an average of 5 minutes longer than men to religious activities on weekend days though there was no statistically significant difference in time spent doing religious activities across gender on weekend days.

6.4.9 Socialising, Communicating and Going Out

The activity group socialising, communicating and going out is subdivided into three activities: spending time and chatting with family and friends; phoning and texting family and friends; and eating or going out. Three percent more men than women spend time chatting with family and friends on weekdays and two percent more men than women allocate time to chat with family and friends on weekend days. Women spend an average of

6 minutes longer than men chatting to family and friends on weekdays and 10 minutes longer than men at weekend days. These results are not statistically significant for weekdays or weekend days. Conversely, three times more women than men reported phoning and texting friends and family on weekdays while on weekend days thirteen percent more women than men reported phoning and texting friends and family. Women spend significantly ($p<0.01$) longer (6 minutes more on weekdays and weekend days) than men phoning and texting family friends on weekdays and weekend days. Ten percent of men eat or go out on weekdays compared to seven percent of women while on weekend days thirty seven percent of men eat or go compared to just seventeen percent of women. Men spend 6 minutes longer than women eating and going out on weekdays and significantly ($p<0.01$) longer (37 minutes longer) than women eating and going out on weekend days.

Analysing socialising, communicating and going out as one activity group, fifty four percent of men partake in some form of social activity on weekdays compared to sixty one percent of women who reported partaking in some form of socialising on weekdays. On weekend days fifty four percent of men recorded doing at least one type of social activity while sixty percent of women reported doing one form of social activity. Altogether men spend 55 minutes socialising, communicating and going out on weekdays compared to the 61 minutes that women spend on the same activities on weekdays. The opposite is the case at the weekend when men spend 2 hours and 8 minutes socialising, communicating and going out compared to the 1 hour and 48 minutes that women spend doing the same activities.

In summary, women spend more time than men socialising informally on both weekdays and weekend days. However, men spend twice as long as women on formal socialising such as eating out or going out to pubs on weekdays and significantly longer on weekend days. Gender differences in social participation somewhat mirror the mean time spent on social participation: women are more likely to phone and text family and friends and men are more likely to eat or go out. However, even though women spend more time chatting to family and friends, men are more likely to participate in this activity.

6.4.10 Sports, Exercise and Leisure

Proportionately, a larger number of women partake in playing sports and physical exercise, productive exercise, using the internet and doing hobbies and other leisure activities than men both on weekdays and weekend days. Attending sports related activities is the only sport, exercise or leisure activity where a larger proportion of men than women participate and almost twice as many men than women participate in these activities on weekend days. Women spend significantly ($p<0.05$) more time (13 minutes more) playing sports and getting physical exercise on weekend days compared to men, who averaged 9 minutes on weekend days. Women also spend significantly ($p<0.1$) more time than men using the computer or internet for personal use (5 minutes more) and doing hobbies and other leisure activities (8 minutes more) on weekend days. Women spend more time than men attending sports related activities, using the computer or internet for personal use and doing hobbies or other leisure activities on weekdays, though the time differences are not significant. While women spend slightly more time (1 minute) than men attending sports related activities on weekdays, men spend 17 minutes more than women attending sports related activities on weekend days though this difference is not statistically significant either.

Combining playing sports, getting physical exercise, productive exercise, attending sports related activities, computer use and hobbies into one activity group called sports, exercise and leisure, just twenty seven percent of men participate in at least one sports, exercise or leisure activity on weekdays compared to forty percent of women. The proportion of men that participate in at least one sport, exercise or leisure activity on weekend days increases to thirty three percent and the proportion of women who do at least one of these activities also increases (to fifty three percent) on weekend days.

Comparing these results to those from the Irish National Time Use Survey 2005 (ESRI, 2005), on weekdays thirty five percent of males and twenty nine percent of females participate in at least one sports, exercise or leisure activity. At the weekend, forty four percent of men and thirty four percent of women take part in some form of sports, exercise or leisure activity. Therefore, we can conclude that the average man in Ireland is more likely to participate in at least one sport, exercise or leisure related activity on a weekday and on a

weekend day then a man living on a farm in the West of Ireland. However, the opposite is the case for women with women living on farms in the West of Ireland more likely to participate in at least one sport, exercise or leisure activity than the average woman on a weekday and on a weekend day. A possible explanation for men living in farm households being less active than men from the national population with regard to sports and exercise is that they may feel they are getting the necessary exercise when working on the farm as farm work generally demands large quantities of manual labour. Rurality or distance to nearest village or town is another possible explanation. The determinants of the participation in and the time allocated to various leisure activities are explored further in Chapter 9.

6.4.11 TV/ Radio/Reading

Ten percent more men than women reported watching television or listening to the radio on weekdays, though on weekend days three percent more women than men watch television or listen to the radio. The results show that men spend more time than women watching television and listening to the radio on weekdays and on weekend days, though the differences in time allocation across gender are not significant. The opposite is the case for reading with women spending significantly ($p<0.1$) more time (11 minutes on weekdays and 20 minutes on weekend days) than men reading on weekdays and weekend days. In line with the average time spent reading, a larger proportion of women (ten percent more) read on weekdays compared to men and seventeen percent more women than men read on weekend days.

6.5 Summary and Discussion

The following section summarises the key results and overall patterns of the time allocation of farm household members from a sample of farm households in the West of Ireland. It also discusses the key differences relating to participation in and the number of hours allocated to various activities across gender and suggests areas of research which require further in-depth analysis.

The activities recorded by the highest proportion of farm household members are sleeping, eating, personal care and farming of animals. On weekdays, activities such as study and education, non-paid activities related to farming, civic activities, eating out and going out, productive exercise, attending sports related events and hobbies were recorded by less than ten percent of farm household members. On weekend days, less than ten percent of farm household members allocated any time to study and education, planting and harvesting, administration related to farming, non-paid activities related to farming, childcare, caring for adults, civic activities, informal help to other households, productive exercise or using the computer or internet for personal use. On weekdays, farm household members in the West of Ireland spend, on average, almost 10 hours on personal care, resting and sleeping, 4 hours, 17 minutes doing farm related activities, a little over 2 hours in paid employment, 20 minutes on voluntary activities, 24 minutes on sports and leisure activities and 57 minutes on socialising and going out. On weekend days, respondents allocate over 10 hours to personal care, resting and sleeping, 3 hours, 24 minutes to farm related activities, 20 minutes to paid employment, 14 minutes to volunteering, 59 minutes to sports and leisure activities and 2 hours to socialising and going out.

Time allocated to helping other households informally is recorded and quantified here for the first time. A significantly larger proportion of farm household members participate in voluntary activities, either civic related activities or helping other households informally, on weekdays and weekend days than members of the national population. Farm household members also allocate significantly more time to both formal and informal voluntary activities than members of the general population. A higher proportion of men than women partake in civic related activities and informally helping other households on weekdays and weekend days. Men also allocate more time than women to civic related activities on weekdays and weekend days, though the difference in time use between men and women is not statistically significant. Men allocate more time to helping other households informally on weekdays, but women allocate more time to helping other households informally on weekend days though neither of these variations in time use across gender are significantly different.

More farm household members in the West of Ireland chat and spend time with family, friends and neighbours compared to members of the entire population. The opposite is true for phoning and texting friends and neighbours, where a significantly larger proportion of the national population partake in such activities compared to farm household members. On the other hand, a significantly higher proportion of the national population participate in sports, exercise and sports related activities on weekdays, but more farm household members than the general population participate on weekend days. Women spend significantly more time than men phoning and texting family and friends, while men spend significantly longer than women eating out and going out at the weekend. Finally, more farm household members allocate time to watching television, listening to the radio or reading than members of the national population. Further analysis of the decision to participate in and the number of hours to allocate to various leisure activities can be found in Chapter 9.

Looking next at travel and paid employment, a significantly larger proportion of the general population of Ireland travel on weekdays and on weekend days than farm household members. Farm household members also spend significantly less time, on average, travelling than the average person in Ireland. The proportion of farm household members that participate in paid employment is significantly lower than the proportion of the national population that participate in paid employment on weekdays and weekend days. Farm household members also spend significantly less time, on average, in paid employment on weekdays and weekend days than members of the general population.

Over three quarters of farm household members do some farm related activity on weekdays and on weekend days. Farm related activities account for eighteen percent of the average farm household member's weekday and fourteen percent of their weekend day. The participation in and the time allocated to farm related activities varies significantly between men and women with men allocating significantly more time to most farm related activities than women. Conversely, women allocate significantly more time to housework and household related tasks on weekdays and weekends. A significantly larger proportion of the national population do some form of childcare on weekdays and weekend days than farm household members. Members of the general population of Ireland also spend significantly

longer doing childcare activities on weekdays and weekend days. On the other hand, a significantly larger proportion of farm household members care for adults on weekdays and weekend days than members of the general population. Women spend significantly more time than men caring for children and adults on weekdays but only spend significantly more time than men caring for children on weekend days.

There is an extensive literature examining the gender division of time allocated to household labour (Press and Townsley, 1998; Bianchi *et al.*, 2000; Fafchamps and Quisumbing, 2003; McGinnity and Russell, 2008) but few using data from Ireland and even less research examining the gender division of time allocated to farm related activities. In this context, the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey* provides, for the first time, important baseline information on the patterns of time use of women and men from farm households in the West of Ireland. However, further analysis of the gender dimensions of time allocation to household and farm related activities is merited in order to fully understand the division of labour among farm household. The larger proportions of farm household members in the West of Ireland participating in and the significantly larger allocation of time of farm household members to voluntary activities compared to the general population is particularly noteworthy and is consistent with the belief that voluntary activity has evolved uniquely in rural Ireland. This also warrants further investigation and sets the context for Chapter 8 in which the determinants of the decision to participate in and the number of hours dedicated to civic engagement and voluntary activities are examined.

7. The Factors Associated with the Allocation of Time by Farm Household Members

7.1 Introduction

The previous chapter presented an overview of the allocation of time of farm household members in the West of Ireland, as well as an analysis of differences in time allocation across gender. There are of course a number of other dimensions across which time allocations are likely to differ, and these are considered in this chapter. Within this context, the objective of this chapter is to permit a better understanding of the role of socioeconomic, family, farm and community characteristics in shaping daily time use and activity patterns. A range of variables are considered, including age, educational level, income, employment status, farm size, and length of time residing in the community. The analysis in the following sections consists of cross-tabulations of key variables in an attempt to illustrate potential associations and relationships. It is worth noting from the outset that multivariate analysis is needed to validate the cross-tabulation results presented in this chapter. Though the analysis is basic and quite descriptive in nature, it nonetheless identifies areas that merit further research and thus, provides the basis for future research. The existence of associations between variables is tested for using the non-parametric Kruskal-Wallis and Mann-Whitney U tests described in Section 6.2.2. Since Chapters 8 and 9 examine civic engagement, voluntary and leisure activities more extensively, the results in this chapter are presented with an emphasis on these activities.

The chapter begins by considering differences in time use patterns by age in Section 7.2. Next, Section 7.3 examines time use patterns across socioeconomic characteristics such as education, household income and off-farm work. Following this, Section 7.4 investigates the differences in time allocation across a range of family characteristics such as marital status, the presence and the number of children. The relationship between farm size and the allocation of time is examined in Section 7.5, as is seasonal variation in time use patterns. The final dimension of time use that is considered is the allocation of time and its relationship to community. Section 7.6 examines the association between the time use

patterns of farm household members and the distance they live from the nearest village or town, the size of the community they reside in and the length of time they have resided or farmed in the area.

7.2 Time Use Patterns and Age

It is well established in the literature that time use changes across the life cycle (Robinson, 1999b; Apps and Rees, 2005; McGinnity *et al.*, 2005). This can be attributed in some way to societal expectations about the appropriate activity across the life cycle and the key transitions in the life cycle of a household. In most western societies, people spend their early years (0-25 years) learning and socialising, in preparation for the work expected of them in the middle part of their lives (26-60 years). Past a certain age, people retire whereby they are unburdened of the necessity of doing most forms of work. For these reasons, age plays a large role in the way time is allocated. Table 7-1 presents the differences in time allocation in each of the thirty activities based on age group[27]. The patterns of time use of farm household members were also analysed by age group across gender for weekdays and weekend days. For comparison of time use by age, four age groups were compared using the Kruskal-Wallis test. The significance levels were set at $p<0.1$, $p<0.05$ and $p<0.01$.

Farm household members in the youngest and oldest age categories recorded the largest average times allocated to personal care, rest and sleep on weekdays. On weekend days, those in the oldest age category, 61 years plus, recorded the highest average times allocated to personal care, rest and sleeping. There is a significant difference ($p<0.01$) in time allocated to personal care, resting and sleeping on weekdays and on weekend days across the four age groups. There is also a significant ($p<0.01$) negative relationship between age and the average time spent travelling on weekdays. Respondents in the youngest cohort spend the most time travelling on weekdays, 105 minutes, compared to the oldest cohort, who spend the least amount of time travelling on weekdays, 26 minutes. There is no significant variation in time allocated to travelling on weekend days across the four age groups.

[27] Standard deviations have been omitted from this table and subsequent tables in this chapter for clarity and presentational reasons.

There is a significant ($p<0.01$) difference in the average time allocated to paid employment on weekdays across age groups. Not surprisingly, respondents in the 26-40 years of age category allocate the most time (1 hour, 50 minutes) to paid employment. The average time allocated to paid employment decreases with age. A similar pattern emerges on weekend days, though the differences are not significant. On weekdays, respondents in the 18-25 years of age category spend the most time (5 hours, 41 minutes) doing farm related activities while those aged 26-40 years spend the least amount of time (3 hours, 23 minutes) doing farming related activities. There are significant differences in the time allocated to farming animals ($p<0.05$) and doing maintenance on the farm ($p<0.1$) across the four age groups on weekdays but not on weekend days.

The oldest cohort reported allocating the highest average time to religious activities, watching television and listening to the radio on weekdays and weekend days. The differences in time spent doing religious activities are significant ($p<0.01$) across age categories on weekend days but not on weekdays. Across the four age groups, there is a significant ($p<0.1$) difference in the average time allocated to watching television and listening to the radio on weekdays but not on weekend days. There is also a significant positive relationship between age and time allocated to reading on weekdays ($p<0.1$) and weekend days ($p<0.05$). Respondents in the 61 plus age category spend an average of 23 minutes more on weekdays and 26 minutes more on weekend days reading than those in the 26-40 years of age category.

On average, the youngest group, those between 18 and 25 years of age, allocate more time to socialising, going out, playing sport, exercising and doing leisure activities on weekdays and weekend days than any other age group. Consequently, as already determined, respondents in the youngest age group spend the least time watching television, listening to the radio and reading on weekdays and weekend days. They also allocate the least amount of time to housework and other household tasks on weekdays and weekend days though the variations in time use are not significantly different. It should also be noted that those who are 60 years or more allocate the most time to phoning and texting family, friends and neighbours on weekdays and weekend days compared to those in the other age groups. The average time allocated to civic related activities is highest amongst those in the 41-60 years

of age category on weekdays and weekend days. On the other hand, respondents in the 61 years and over category allocate the most time, on average, to helping other households informally on weekdays and weekend days compared to respondents in the other age groups. This is likely attributed to those in the 60 years plus category being retired and having more free time available. Another possible explanation is that those in the older age cohort are living in their community's longer (rootedness), and thus know their neighbours better and have built strong friendships with the people in their area.

Finally, the allocation of time across the four age groups by gender and for weekdays and weekend days is examined. The results of this analysis are presented in Appendix D. The results show that when gender is controlled for, there is a significant ($p<0.01$) difference in the average time allocated to paid employment on weekdays across age groups for men only. Consistent with expectations, the average time allocated to paid employment by men decreases with age. On weekdays, men in the 61+ years of age category allocate significantly more time to farming of animals than any other age category. With regard to farm maintenance, men in the 18-25 years of age category allocate significantly more time to farm maintenance than men in the other age categories. The differences in time allocated to farming of animals and farm maintenance across age groups are not statistically significant for women though time allocated to cooking and food preparation on weekdays is significantly different for women. Women in the 41-60 years of age category allocate the most time (1 hour, 46 minutes) to cooking and food preparation on weekdays.

For both men and women, there are statistically significant differences in the allocation of time to religious activities across the four age categories on weekend days. Women in the 41-60 years of age category allocate the most time (45 minutes) to religious activities though men in the 61+ years of age category allocate the most time (42 minutes) to religious activities. Controlling for gender, it is evident that there are statically significant differences in the allocation of time to chatting with family, friends and neighbours on weekend days for women but not for men. Women in the 18-25 years of age category spend significantly ($p<0.1$) more time chatting with family, friends and neighbours on weekend days than women in any other age group. The results for chatting with family, friends and neighbours are not statistically different for men though time allocated to eating or going out is

significantly ($p<0.1$) different across age groups for men on weekend days. As expected, men in the 18-25 years of age category allocate significantly more time (4 hours, 30 minutes) to eating and going out on weekend days than men in any other age category. When gender is controlled for the statistically significant differences in time allocated to watching television, listening to the radio and reading across age groups on weekdays become insignificant as do the significant differences in time allocated to reading on weekend days.

Table 7-1 Average Daily Duration of Activities in Minutes by Age

Activity Group	Activity	Weekday					Weekend				
		All Persons					All Persons				
		18-25 yrs	26-40 yrs	41-60 yrs	61+ yrs	Sig.	18-25 yrs	26-40 yrs	41-60 yrs	61+ yrs	Sig.
Personal Care/ Resting	**Personal Care/ Resting/ Sleeping**	**641.3**	**552.5**	**564.0**	**650.8**	***	**623.8**	**625.0**	**612.2**	**665.1**	***
Travel	**Travel**	**105.0**	**52.5**	**35.1**	**26.1**	***	142.5	16.9	36.4	32.5	ns
Paid Employment or Study	**Paid Employment**	**0.0**	**290.6**	**158.7**	**30.0**	***	0.0	76.3	21.9	2.0	ns
	Study/ Education	0.0	**5.0**	0.6	0.0	ns	0.0	0.0	0.2	0.2	ns
	Breaks from Work/ Study	33.8	24.4	29.7	18.4	ns	7.5	24.4	23.5	16.3	ns
Farm Related Activities	**Planting/ Harvesting/ Picking/ Weeding**	48.8	33.8	26.6	14.7	ns	0.0	41.9	17.7	9.4	ns
	Farming of Animals	**97.5**	**91.3**	**151.0**	**191.8**	**	86.3	146.9	135.4	144.0	ns
	Farm Maintenance	**187.5**	**58.8**	**54.3**	**74.8**	*	67.5	62.5	44.9	25.1	ns
	Administration Related to Farming	7.5	8.8	11.0	12.2	ns	0.0	2.5	6.8	4.3	ns
	Non-Paid Activities Related to Farming	0.0	0.0	0.8	1.8	ns	0.0	0.0	1.6	4.3	ns
Housework & Other Household Tasks	**Cooking & Food Preparation**	3.8	25.6	49.4	50.1	ns	0.0	43.1	64.7	55.3	ns
	Housework	18.8	30.0	51.0	42.7	ns	0.0	27.5	35.9	30.7	ns
	Other Domestic Work inc. DIY, House Repairs etc.	0.0	3.8	23.7	23.7	ns	37.5	23.1	19.0	17.4	ns
Shopping & Appointment	**Shopping/ Errands/ Appointments**	3.8	14.4	24.6	32.7	ns	**127.5**	**16.9**	**33.2**	**27.5**	**
Caring for Others	**Childcare**	0.0	62.5	20.7	4.2	ns	0.0	61.3	10.1	14.5	ns
	Caring for Adults	0.0	0.0	22.1	8.5	ns	0.0	0.0	13.2	9.2	ns
Voluntary	**Civic Activities**	0.0	0.0	10.3	8.8	ns	0.0	0.0	14.4	9.0	ns
	Informal Help to Other Households	0.0	10.0	9.4	15.7	ns	0.0	0.0	2.4	5.1	ns
Religious Activities	**Religious Activity**	0.0	0.0	3.6	6.4	ns	**0.0**	**5.0**	**37.2**	**39.8**	***
Socialising/ Communicating/ Going Out	**Spending Time/ Chatting with Family/ Friends/ Neighbours**	78.8	41.9	33.8	42.2	ns	82.5	36.3	59.1	70.7	ns
	Phoning/ Texting/ Family, Friends or Neighbours	3.8	3.8	7.2	10.2	ns	0.0	5.6	5.7	14.5	ns
	Eating Out/ Going Out	63.8	16.9	11.1	6.0	ns	202.5	62.5	55.2	33.3	ns
Sports/ Exercise/ Leisure	**Playing Sports/ Physical Exercise**	30.0	27.5	10.0	8.8	ns	0.0	13.1	15.3	10.8	ns
	Productive Exercise	0.0	0.0	0.0	3.5	ns	0.0	6.3	0.8	4.0	ns
	Attending Sports Related Activities	0.0	0.0	5.6	0.7	ns	150.0	26.3	23.7	11.4	ns
	Computer/ Internet for Personal Use	15.0	8.8	4.8	5.1	ns	0.0	3.1	6.6	4.7	ns
	Hobbies/ Other Leisure Activities	0.0	2.5	3.8	3.0	ns	67.5	10.0	14.2	18.3	ns
TV/ Radio	**Watching TV/ Listening to the Radio**	**97.5**	**65.0**	**95.3**	**113.3**	*	45.0	89.4	105.5	120.4	ns
	Reading	**3.8**	**10.0**	**21.1**	**32.8**	*	**0.0**	**14.4**	**22.0**	**40.5**	**
Other	**Other**	0.0	0.0	0.9	1.1	ns	0.0	0.0	1.2	0.0	ns

Note. ns = not significant. Using Kruskal-Wallis tests**, c**omparisons in bold are sign significantly different at * p<0.1, **p<0.05, *** p<0.01

7.3 Time Use Patterns and Socioeconomic Characteristics

Higher levels of education and income and the incidence of an off-farm job facilitate increased access to skills and resources. This is more pronounced in the case of income as higher levels of income provide the resources to purchase technology or the services to do the things one would like to do. Education and an off-farm job provide what Robinson (1999b) calls 'cultural capital'. Cultural capital provides access to more specialised and varied ways of spending time, such as being able to derive meaning, insight, and satisfaction from reading a book, enjoying a gourmet meal, or attending a play. It is most likely that people who are more highly educated have the skills to find and enjoy a wider variety of activities and the income to pay for them. They may also have the occupational co-workers with whom to share their experiences and therefore to reinforce their value. Thus, level of education, income and the incidence of an off-farm job are highly correlated. The sections that follow explore the differences in time use patterns of farm household members across these dimensions.

7.3.1 Time Use Patterns and Education

The allocation of time of farm household members across five levels of education are summarised in Table 7-2. Farm household members with the lowest level of education spend significantly ($p<0.05$) more time on personal care, resting and sleeping on weekdays than those with a leaving certificate, post leaving certificate or third level education. Participants whose highest level of education is the junior certificate spend the least amount of time on personal care, resting and sleeping on weekdays (9 hours, 35 minutes).

There is a significant ($p<0.05$) positive relationship between the allocation of time to paid employment and level of education on weekdays but not on weekend days. Farm household members with a third level education allocate 2 hours and 42 minutes more than those with a primary education to paid employment on weekdays. The relationship between level of education and time allocated to paid employment may be influenced by age because educational qualifications are lower amongst older age groups and this group are most likely to be retired.

The average time allocated to farming animals decreases as the level of educational attainment increases. This is true for weekdays and weekend days and is significant at $p<0.01$. A similar pattern emerges for farm maintenance though this relationship is significant ($p<0.05$) on weekdays only. The average time allocated to cooking and preparing food is highest among the more educated on weekdays and weekend days though the variations in time use across the five levels of education are significant ($p<0.1$) for weekend days only. Similarly, farm household members who have achieved a third level education or higher spend 13 minutes more than those with a primary level of education shopping and running errands on weekdays ($p<0.1$), though there are no significant differences on weekend days.

No clear pattern emerges with regard to time allocated to civic engagement or voluntary activities and none of the variations are statistically significant. On weekdays and weekend days there is little variation between time spent participating in civic activities and level of education. On weekdays respondents with a post leaving certificate qualification allocate the most time to civic related activities while on weekend days those with a leaving certificate allocate the most time to civic related activities. On weekdays farm household members with a primary level of education spend the most time helping other household informally while on weekend days those with a leaving certificate or equivalent spend the most time helping other households informally.

Level of education is significantly ($p<0.01$) negatively related to time allocated to watching television and listening to the radio on weekdays. Farm household members with the lowest level of education spend 56 minutes more watching television and listening to the radio on weekdays than those with the highest levels of education. The differences in time allocated to watching television and listening to the radio across levels of education on weekend days are smaller than for weekdays and are not statistically significant. Further multivariate analysis controlling for employment status and age are necessary to establish whether education has any independent effect on time allocated to passive leisure activities such as watching television.

Table 7-2 Average Daily Duration of Activities in Minutes by Highest Level of Education Completed

Activity Group	Activity	Weekday						Weekend					
		All Persons						All Persons					
		Primary	Junior Certificate	Leaving Certificate or Equivalent	Post Leaving Certificate/Other	Third Level	Sig.	Primary	Junior Certificate	Leaving Certificate or Equivalent	Post Leaving Certificate/Other	Third Level	Sig.
Personal Care/ Resting	**Personal Care/ Resting/ Sleeping**	**619.5**	**575.6**	**590.3**	**596.5**	**583.1**	**	650.3	606.4	635.2	604.5	640.2	ns
Travel	**Travel**	27.0	28.2	40.7	32.4	57.1	ns	26.7	30.5	44.1	34.1	45.5	ns
Paid Employment or Study	**Paid Employment**	**45.5**	**139.5**	**131.9**	**156.3**	**207.6**	**	10.9	2.5	31.4	41.4	19.8	ns
	Study/ Education	0.0	0.9	0.5	0.0	3.9	ns	0.0	0.2	0.0	0.0	1.0	ns
	Breaks from Work/ Study	26.0	29.1	26.1	17.4	23.7	ns	18.8	30.5	18.3	19.9	10.2	ns
Farm Related Activities	**Planting/ Harvesting/ Picking/ Weeding**	11.0	34.7	9.0	45.8	11.6	ns	16.3	20.2	3.6	33.2	13.6	ns
	Farming of Animals	**215.3**	**173.1**	**151.0**	**105.8**	**97.3**	***	**157.1**	**173.6**	**135.2**	**90.8**	**97.3**	***
	Farm Maintenance	**74.3**	**88.0**	**68.2**	**28.0**	**29.5**	**	29.0	55.0	46.7	25.1	41.6	ns
	Administration Related to Farming	11.8	9.6	15.7	11.8	4.4	ns	4.6	8.4	1.4	2.8	11.6	ns
	Non-Paid Activities Related to Farming	3.5	0.0	0.2	0.0	1.5	ns	3.1	2.7	1.9	0.0	3.9	ns
Housework & Other Household Tasks	**Cooking & Food Preparation**	38.3	37.8	50.8	55.3	60.0	ns	**39.4**	**55.9**	**63.1**	**71.0**	**75.5**	*
	Housework	30.3	34.7	47.2	72.6	62.4	ns	24.9	27.7	34.1	42.6	44.0	ns
	Other Domestic Work inc. DIY, House Repairs etc.	22.8	16.6	21.3	26.1	25.2	ns	21.1	15.0	17.9	17.8	27.6	ns
Shopping & Appointment	**Shopping/ Errands/ Appointments**	**25.5**	**14.3**	**30.0**	**30.0**	**38.2**	*	33.1	24.1	31.4	41.0	20.8	ns
Caring for Others	**Childcare**	9.3	14.8	18.4	57.2	1.9	ns	7.9	17.7	8.6	48.2	6.8	ns
	Caring for Adults	7.0	16.3	27.8	10.3	11.6	ns	2.3	15.2	13.8	10.1	10.7	ns
Voluntary	**Civic Activities**	10.3	5.8	8.5	12.2	8.2	ns	8.9	2.5	23.3	15.4	4.8	ns
	Informal Help to Other Households	19.8	5.6	16.0	0.8	12.6	ns	3.1	1.6	7.4	0.0	1.0	ns
Religious Activities	**Religious Activity**	1.0	4.0	9.9	2.0	0.0	ns	43.0	31.4	30.0	28.8	39.2	ns
Socialising/ Communicating/ Going Out	**Spending Time/ Chatting with Family/ Friends/ Neighbours**	47.0	38.5	31.0	39.5	33.9	ns	72.7	54.6	43.1	69.7	82.7	ns
	Phoning/ Texting/ Family, Friends or Neighbours	9.5	8.5	3.6	5.9	9.2	ns	15.3	5.5	4.8	8.1	10.2	ns
	Eating Out/ Going Out	9.8	14.3	6.1	4.7	22.7	ns	57.5	65.9	40.7	50.7	27.1	ns
Sports/ Exercise/ Leisure	**Playing Sports/ Physical Exercise**	11.0	6.1	8.7	16.2	25.7	ns	7.4	18.4	14.5	13.4	13.6	ns
	Productive Exercise	3.0	0.0	1.9	0.0	0.0	ns	2.0	4.1	0.0	2.4	3.9	ns
	Attending Sports Related Activities	2.0	5.8	3.9	3.6	0.0	ns	12.0	15.9	32.6	32.0	22.3	ns
	Computer/ Internet for Personal Use	3.3	4.3	4.4	6.3	13.6	ns	5.6	3.4	4.3	4.5	14.5	ns
	Hobbies/ Other Leisure Activities	2.3	3.4	1.9	6.3	4.8	ns	17.5	14.8	21.9	11.8	9.7	ns
TV/ Radio	**Watching TV/ Listening to the Radio**	**124.0**	**110.4**	**90.0**	**75.0**	**68.2**	***	118.7	109.3	107.1	93.7	107.9	ns
	Reading	30.5	20.2	25.2	18.6	19.4	ns	31.0	27.1	22.6	27.2	29.5	ns
Other	**Other**	0.0	0.0	0.0	3.6	2.9	ns	0.0	0.0	1.0	0.0	3.9	ns

Note. ns = not significant. Using Kruskal-Wallis tests, comparisons in bold are significantly different at * p<0.1, **p<0.05, *** p<0.01

7.3.2 Time Use Patterns and Total Household Income

The allocation of time of farm household members in the highest and lowest total household income bands are summarised in Table 7-3. On weekdays income has a significant effect on the allocation of time to personal care, resting and sleeping, paid employment, breaks from work or study and eating and going out. On weekend days, income significantly effects the allocation of time to personal care, resting and sleeping and caring for adults. There is a significant negative relationship between household income and time allocated to personal care, resting and sleeping on weekdays ($p<0.05$) and weekend days ($p<0.1$). Respondents residing in households with the highest level of income (> €70,000) spend 1 hour and 22 minutes less on personal care, resting and sleeping on weekdays than those from households with the lowest level of income (0 - €9,999). On weekend days, respondents living in farm households with a total household income falling into the highest income band spend an hour less on personal care, resting and sleeping than those residing in households with an income falling into the lower income band.

As expected a priori, there is a positive relationship between time allocated to paid employment and total household income, though the relationship is significant for weekdays only ($p<0.01$). Respondents living in households with the highest total household income spend an average of over two hours more (on weekdays) in paid employment than respondents living in households with the lowest household income. Consequently, respondents from households with higher total household income spend significantly ($p<0.05$) more time (8 minutes more) taking breaks from work or study on weekdays than those from households with the lowest level of household income. The results are not significant for weekend days.

On weekdays, farm household members with the lowest and highest total household incomes allocate the most time (between 22 and 25 minutes) caring for adults, though these results are not significant. However, on weekend days, respondents with the highest household income allocate significantly ($p<0.1$) more time (22 minutes more) to caring for adults than those with the lowest household income. Farm household members with larger household incomes spend significantly ($p<0.05$) more time eating and going out on weekdays compared to those with lower household incomes. On weekend days, those with lower household incomes spend

more time eating and going out than those with higher incomes, though the differences are not significant.

Farm household members with the two lowest levels of household income allocate more time to voluntary activities (civic engagement and informal help to other households) on weekdays and weekend days than those with higher household incomes. On weekdays, respondents with household incomes of 0-€9,999 allocate an average of 28 minutes to voluntary activities. Those with incomes of between €10,000 and €29,999 allocate an average of 26 minutes to voluntary activities, 12 minutes more than those in the €70,000 plus income band. On weekdays, the pattern is similar though less time is allocated to voluntary activities across all income bands on weekend days compared to weekdays. On weekend days the time allocated to civic engagement activities is higher than that allocated to helping other households informally, across the five income bands. On weekdays, more time is generally allocated to helping other households informally than to civic engagement activities.

On weekdays and weekend days, farm household members with higher levels of household income allocate more time to chatting and spending time with family and friends than those with lower levels of household income. On the other hand, farm household members with lower levels of household income allocate more time to phoning and texting family and friends than those with higher levels of household income. Time allocated to playing sports, getting physical exercise, attending sports related activities and hobbies is generally higher among farm household members with higher levels of household income though the differences are not statistically significant. Thus, time allocated to productive exercise, computer and internet use and watching television is generally higher among farm household members with lower levels of household income.

Table 7-3 Average Daily Duration of Activities in Minutes by Total Household Income

Activity Group	Activity	Weekday						Weekend					
		All Persons						All Persons					
		0 - €9,999	€10,000 - €29,999	€30,000 - €49,999	€50,000 - €69,999	> €70,000	Sig.	0 - €9,999	€10,000 - €29,999	€30,000 - €49,999	€50,000 - €69,999	> €70,000	Sig.
Personal Care/ Resting	**Personal Care/ Resting/ Sleeping**	**632.8**	**615.8**	**563.0**	**563.9**	**550.4**	**	**656.5**	**636.2**	**598.0**	**641.4**	**595.8**	*
Travel	**Travel**	24.6	31.5	38.0	41.4	48.1	ns	40.1	27.4	30.3	44.2	45.8	ns
Paid Employment or Study	**Paid Employment**	**30.6**	**128.8**	**149.3**	**170.7**	**178.1**	***	15.0	32.8	13.0	14.6	18.1	ns
	Study/ Education	2.3	0.4	1.3	0.0	0.0	ns	0.0	0.0	0.0	0.4	0.8	ns
	Breaks from Work/ Study	**17.8**	**19.5**	**34.7**	**32.0**	**26.2**	**	16.2	18.6	28.0	26.4	16.5	ns
Farm Related Activities	**Planting/ Harvesting/ Picking/ Weeding**	30.9	13.3	15.3	27.6	41.5	ns	28.3	17.8	12.3	5.3	19.6	ns
	Farming of Animals	155.4	168.9	170.3	143.1	131.2	ns	125.5	141.6	160.0	111.9	149.2	ns
	Farm Maintenance	74.7	42.4	87.0	65.3	62.7	ns	36.4	27.9	53.3	47.8	56.5	ns
	Administration Related to Farming	15.9	9.0	8.7	19.5	6.2	ns	7.2	4.9	8.7	4.9	2.3	ns
	Non-Paid Activities Related to Farming	1.1	2.1	0.0	0.0	1.2	ns	2.3	3.8	1.3	0.0	3.1	ns
Housework & Other Household Tasks	**Cooking & Food Preparation**	55.8	45.9	51.3	35.7	45.0	ns	46.2	60.6	57.7	55.1	76.5	ns
	Housework	52.6	47.3	34.3	49.9	46.5	ns	40.4	33.4	26.3	25.5	40.8	ns
	Other Domestic Work inc. DIY, House Repairs etc.	22.4	24.4	30.7	16.2	11.5	ns	26.5	15.8	22.0	17.4	16.5	ns
Shopping & Appointment	**Shopping/ Errands/ Appointments**	24.6	25.9	19.0	35.3	29.6	ns	48.8	31.1	32.0	18.2	19.6	ns
Caring for Others	**Childcare**	15.0	8.8	32.7	10.1	40.4	ns	13.6	10.3	19.7	7.7	37.7	ns
	Caring for Adults	24.6	13.1	9.3	10.1	21.5	ns	**6.9**	**8.8**	**5.7**	**7.7**	**28.5**	*
Voluntary	**Civic Activities**	15.3	7.1	3.0	8.9	8.5	ns	17.3	17.1	4.7	4.1	6.5	ns
	Informal Help to Other Households	13.3	18.6	8.7	5.7	4.6	ns	2.3	4.7	3.0	4.1	0.0	ns
Religious Activities	**Religious Activity**	3.1	6.4	4.7	2.8	1.9	ns	37.8	40.3	30.7	33.2	24.2	ns
Socialising/ Communicating/ Going Out	**Spending Time/ Chatting with Family/ Friends/ Neighbours**	42.5	38.1	18.7	37.3	51.5	ns	71.5	55.9	45.7	58.4	76.5	ns
	Phoning/ Texting/ Family, Friends or Neighbours	14.2	6.9	6.3	6.5	5.4	ns	12.4	10.1	5.7	8.1	4.2	ns
	Eating Out/ Going Out	**5.9**	**8.6**	**4.7**	**19.5**	**20.0**	**	41.5	57.8	61.0	62.8	23.5	ns
Sports/ Exercise/ Leisure	**Playing Sports/ Physical Exercise**	11.3	12.0	14.7	13.4	6.5	ns	6.1	16.3	10.7	17.0	14.6	ns
	Productive Exercise	4.5	0.8	0.0	0.0	0.0	ns	1.7	3.4	2.7	3.2	0.0	ns
	Attending Sports Related Activities	1.1	5.8	0.0	2.4	6.9	ns	7.8	16.3	29.3	24.3	31.5	ns
	Computer/ Internet for Personal Use	5.1	9.2	5.0	2.4	2.3	ns	4.3	5.6	7.0	10.1	1.9	ns
	Hobbies/ Other Leisure Activities	2.3	5.3	0.7	2.4	5.4	ns	17.3	9.9	23.0	15.0	9.6	ns
TV/ Radio	**Watching TV/ Listening to the Radio**	113.8	99.8	99.3	93.2	73.1	ns	89.1	102.4	125.3	125.7	97.3	ns
	Reading	24.1	24.6	27.3	24.7	13.9	ns	21.1	29.4	23.0	43.8	19.6	ns
Other	**Other**	2.6	0.0	2.0	0.0	0.0	ns	0.0	0.0	0.0	1.6	3.1	ns

Note. ns = not significant. Using Kruskall-Wallis tests, comparisons in bold are significantly different at * p<0.1, **p<0.05, *** p<0.01

7.3.3 Time Use Patterns and Off-Farm Work

Declining on-farm incomes are putting farm households under increasing pressure to obtain income from other sources. This goes some way towards explaining why farm households commonly engage in off-farm work and multiple job holding. Forty percent of farm household members surveyed work off the farm. Of those, sixty five percent are men and the remainder are women. It is well documented in the literature that time allocation differs for those who have wage and salary jobs, compared to persons who are self-employed. Self-employed persons, such as farmers, are more likely to work weekends or holidays, work from home and have greater flexibility in allocating their time. Table 7-4 presents the average time allocation of those with and without off-farm jobs across all respondents and across gender. A priori, it was expected that having an off-farm job would have a significant effect on the time allocation of farm household members to many activities.

There is a negative relationship between having an off-farm job and time allocated to personal care, rest and sleeping on weekdays and weekend days, though the difference is significant ($p<0.01$) for weekdays only. The difference remains significant when gender is controlled for. Farm household members with an off-farm job spend an hour and 15 minutes less on weekdays and 16 minutes less on weekend days on personal care, rest and sleep than those without a job off the farm. The relationship between time allocated to travelling and having an off-farm job is significantly ($p<0.01$) positive on weekdays and remains significant when gender is controlled for. As expected, the average time allocated to paid employment is significantly ($p<0.01$) higher on weekdays and weekend days and remains significant when gender is controlled for. Farm household members with an off-farm job allocate an average of 5 hours to paid employment on weekdays and 44 minutes on weekend days.

Unsurprisingly, farm household members, both male and female, without an off-farm job allocate more time to all farm related activities on weekdays and weekend days. On weekdays, respondents without an off-farm job allocate significantly more time to planting, harvesting and weeding ($p<0.05$), farming of animals ($p<0.01$), farm maintenance ($p<0.01$), and administration related to farming ($p<0.1$). On weekend days, farm household members without an off-farm job allocate significantly more time to farming of animals ($p<0.01$) and administration related to farming ($p<0.1$). Time allocated to DIY and other domestic work on

weekdays and weekend days is significantly ($p<0.05$) higher amongst farm household members who do not work off the farm. Farm household members without an off-farm job spend almost twice as long shopping and running errands on weekdays and weekend days compared to those with a job off the farm. These variations in time use are significant ($p<0.01$) on weekdays only and remain significant when gender is controlled for.

Time allocated to helping other households informally on weekdays and weekend days is significantly higher among respondents without an off-farm job. Farm household members without an off-farm job spend 9 minutes longer helping other households informally on weekdays and 2 minutes longer on weekend days than those with off-farm jobs. On weekdays, these results are significant for males but not for females and on weekend days the results are not significant when gender is controlled for. Farm household members without an off-farm job allocate 2 minutes more to civic engagement related activities on weekdays but on weekend days those with an off-farm job allocate almost 3 minutes more to civic engagement related activities, though the differences are not significant for weekdays or weekend days.

Farm household members with an off-farm job spend less time chatting to family and friends on weekdays and weekend days though the difference is significant ($p<0.01$) for weekdays only and remains significant when gender is controlled for. Respondents with an off-farm job also spend significantly less time phoning and texting family and friends than those without off-farm jobs on weekdays ($p<0.1$) and weekend days ($p<0.01$). Farm household members with an off-farm job allocate less time to playing sports and getting physical exercise than those without an off-farm job on weekdays, though the opposite is the case on weekend days. Farm household members with an off-farm job allocate 10 minutes more to playing sports and getting physical exercise on weekend days than those without an off-farm job ($p<0.05$). Members of farm households without an off-farm job allocate 2 minutes more than those with an off-farm job to productive exercise on weekdays and this is significant at $p<0.1$. Not having an off-farm job is significantly ($p<0.05$) positively related to watching television on weekdays but on weekend days reading is significantly ($p<0.1$) positively related to not having an off-farm job.

Table 7-4 Average Daily Duration of Activities in Minutes by Gender and Off-Farm Employment

Activity Group	Activity	Weekday									Weekend								
		All Persons			Men			Women			All Persons			Men			Women		
		Off-Farm Employ	No Off Farm Employ	Sig.	Off-Farm Employ	No Off Farm Employ	Sig.	Off-Farm Employ	No Off Farm Employ	Sig.	Off-Farm Employ	No Off Farm Employ	Sig.	Off-Farm Employ	No Off Farm Employ	Sig.	Off-Farm Employ	No Off Farm Employ	Sig.
Personal Care/	**Personal Care/ Resting/ Sleeping**	**547.9**	**623.4**	***	**552.0**	**610.2**	***	**540.4**	**549.3**	***	612.2	638.1	ns	613.3	628.4	ns	**610.1**	**657.4**	*
Travel	**Travel**	**44.6**	**28.3**	***	**38.5**	**27.2**	**	**56.0**	**30.6**	***	36.5	34.2	ns	32.8	37.4	ns	**43.4**	**27.7**	**
Paid Employment or Study	**Paid Employment**	**302.5**	**6.1**	***	**332.8**	**4.7**	***	**246.1**	**8.9**	***	**44.4**	**3.5**	***	**48.5**	**5.2**	***	**36.9**	**0.0**	**
	Study/ Education	0.9	0.8	ns	1.3	1.2	ns	0.0	0.0	ns	0.3	0.8	ns	0.0	0.0	ns	0.8	0.3	ns
	Breaks from Work/ Study	**34.1**	**19.9**	***	**37.4**	**25.9**	*	**11.8**	**7.8**	***	22.6	20.0	ns	28.5	26.1	ns	11.8	7.9	ns
Farm Related Activities	**Planting/ Harvesting/ Picking/ Weeding**	**16.0**	**26.0**	**	**23.7**	**30.7**	**	1.6	16.7	ns	19.0	15.8	ns	27.8	21.7	ns	2.4	4.1	ns
	Farming of Animals	**103.0**	**195.7**	***	**148.0**	**255.4**	***	**19.1**	**78.5**	**	**114.4**	**154.1**	***	**168.9**	**197.1**	**	**12.6**	**68.8**	***
	Farm Maintenance	**30.4**	**86.6**	***	**46.3**	**126.5**	***	0.8	8.4	ns	42.6	39.4	ns	64.6	57.6	ns	1.6	3.2	ns
	Administration Related to Farming	**7.6**	**13.6**	*	7.6	15.3	ns	7.7	10.4	ns	**3.5**	**6.9**	*	4.6	8.0	ns	1.6	4.7	ns
	Non-Paid Activities Related to Farming	0.4	1.5	ns	**0.0**	**2.1**	*	1.2	0.3	ns	0.6	3.6	ns	**0.0**	**4.2**	*	1.6	2.4	ns
Housework & Other Household Tasks	**Cooking & Food Preparation**	37.8	53.2	ns	20.7	21.9	ns	69.7	114.5	***	61.6	57.0	ns	23.5	32.1	ns	132.6	106.5	ns
	Housework	47.7	44.9	ns	6.7	11.8	ns	124.1	109.9	ns	34.5	32.0	ns	10.7	9.4	ns	79.1	76.8	ns
	Other Domestic Work inc. DIY, House Repairs etc.	**14.2**	**26.7**	**	12.2	15.3	ns	**17.8**	**49.0**	***	**14.9**	**22.2**	**	16.7	23.0	ns	**11.4**	**20.6**	*
Shopping &	**Shopping/ Errands/ Appointments**	**17.7**	**31.9**	***	**11.1**	**21.6**	*	**30.0**	**51.9**	**	28.3	33.7	ns	**14.4**	**24.5**	*	54.3	51.8	ns
Caring for Others	**Childcare**	29.9	11.4	ns	8.0	8.7	ns	70.5	16.7	ns	22.2	11.9	ns	8.3	5.2	ns	48.2	25.3	ns
	Caring for Adults	9.6	18.5	ns	2.4	12.9	ns	23.1	29.4	ns	12.5	8.4	ns	6.5	8.5	ns	23.5	8.5	ns
Voluntary	**Civic Activities**	7.8	9.5	ns	8.9	11.2	ns	5.7	6.1	ns	12.6	10.2	ns	15.0	9.4	ns	8.1	11.8	ns
	Informal Help to Other Households	**6.4**	**14.9**	**	**5.4**	**19.7**	**	8.1	5.5	ns	**2.0**	**3.8**	*	0.9	3.6	ns	4.1	4.1	ns
Religious Activities	**Religious Activity**	3.3	4.7	ns	1.1	3.7	ns	7.3	6.6	ns	30.3	37.1	ns	**25.2**	**37.1**	**	39.8	37.1	ns
Socialising/ Communicating/ Going Out	**Spending Time/ Chatting with Family/ Friends/ Neighbours**	**32.0**	**42.3**	***	**32.4**	**38.7**	*	**31.2**	**49.3**	**	59.4	61.0	ns	51.1	60.3	ns	75.0	62.4	ns
	Phoning/ Texting/ Family, Friends or Neighbours	**4.1**	**10.4**	*	**2.0**	**0.4**	**	8.1	14.4	ns	**3.5**	**11.8**	***	**1.5**	**9.7**	**	7.3	16.2	ns
	Eating Out/ Going Out	13.6	8.9	ns	15.7	11.2	ns	9.7	4.3	ns	51.1	51.5	ns	63.7	64.2	ns	27.6	26.5	ns
Sports/ Exercise/ Leisure	**Playing Sports/ Physical Exercise**	10.8	12.2	ns	7.4	11.0	ns	17.0	14.4	ns	**19.5**	**9.3**	**	17.8	3.4	**	22.7	20.9	ns
	Productive Exercise	**0.0**	**2.0**	*	0.0	1.8	ns	0.0	2.3	ns	2.6	2.2	ns	3.9	0.9	ns	0.0	4.7	ns
	Attending Sports Related Activities	3.0	3.7	ns	2.0	4.1	ns	4.9	2.9	ns	29.7	16.7	ns	39.6	19.8	ns	11.4	10.6	ns
	Computer/ Internet for Personal Use	6.1	5.0	ns	**7.2**	**3.1**	*	4.1	8.7	ns	6.4	5.0	ns	3.3	4.0	ns	12.2	7.1	ns
	Hobbies/ Other Leisure Activities	2.6	3.9	ns	3.9	2.8	ns	**0.0**	**6.1**	**	**11.5**	**19.2**	*	10.2	15.6	ns	13.8	26.2	ns
TV/ Radio	**Watching TV/ Listening to the Radio**	**86.5**	**106.5**	**	**88.0**	**110.7**	*	83.5	98.1	ns	121.1	98.9	ns	123.9	99.4	ns	116.0	97.9	ns
	Reading	19.0	27.0	ns	17.4	21.6	ns	21.9	37.5	ns	**19.3**	**32.4**	*	15.0	23.9	ns	27.2	49.1	ns
Other	**Other**	0.9	0.9	ns	0.0	0.0	ns	2.4	2.6	ns	1.1	0.4	ns	0.0	0.6	ns	3.2	0.0	ns

Note. ns = not significant. Using Mann-Whitney *U* tests, comparisons in bold are significantly different at * p<0.1, **p<0.05, *** p<0.01

7.4 Time Use Patterns and Family Characteristics

Robinson (1999b) described family characteristics such as marriage and parenthood as 'role factors'. Role factors imply strong commitments of time, for example to one's marriage and to one's children. Commitment to marriage and parenthood affect not only farm work, off-farm work and housework differently, but also the things farm household members do in their free time. Thus, they are extremely important factors to control and adjust for when examining variations and trends in time allocation. Their function in predicting time use varies widely depending on the activity in question, though Robinson (1999b) noted that role factors are the most important factors in shaping the way time is allocated. The following sections report the patterns of time use for all activities across marital status, the presence and the number of children.

7.4.1 Time Use Patterns and Marital Status

Farm household members who are single, separated or widowed allocate more time to study and education on weekdays and weekend days than those who are married or have a partner. The difference in the allocation of time across marital status is significant ($p<0.5$) for weekdays only and remains significant when gender is controlled for. Farm household members who are single, separated or widowed also allocate significantly ($p<0.1$) more time (10 minutes more) to breaks from work and study on weekend days than those who are married or have a partner.

Farm household members who are single, separated or widowed allocate significantly ($p<0.01$) more time (55 minutes to an hour more) to farming animals on weekdays and weekend days than those who are married or have a partner. These results remain significant when gender is controlled for. Respondents who are married allocate significantly ($p<0.1$) more time to non-paid activities related to farming on weekdays and this remains significant when gender is controlled for. On weekdays, respondents who are married or have a partner spend significantly ($p<0.01$) more time on childcare than those who are single, separated or widowed. While married respondents allocate more time to childcare on weekends than those who are single, separated or widowed, the difference is not statistically significant.

Respondents who are married or have partners spend an average of 22 minutes more on childcare on weekdays and 16 minutes more on weekend days than those who are single. This is most likely because respondents who are married or have partners are more likely to have children than those who are single, separated or who are widowed. The variations in time allocated to religious activities by marital status are statistically significant ($p<0.05$) for weekdays and weekend days. Farm household members who are married allocate approximately 4 minutes more to religious activities on weekdays and 12 minutes more on weekend days than those who are single. These results remain statistically significant when gender is controlled for.

Differences in time allocated to socialising, communicating or going out by marital status are not significant for weekdays or weekend days. At the aggregate level, on weekdays the time allocated to socialising, communicating and going out is the same whether the respondent is married or has a partner or is single, separated or widowed. On weekend days, respondents who are married or have partners spend 10 minutes more socialising, communicating and going out than those who are single though these differences are not statistically different. On weekend days farm household members who are married or have partners spend twice as much time as those who are single, separated or widowed chatting with family and friends. On the other hand, on weekend days farm household members who are single, separated or widowed spend more time eating out and going out than those who are married or have partners.

Looking at voluntary activities, the variation in time allocated to civic related activities and helping other households informally is not statistically significant across the two groups. Farm household members who are single, separated or widowed spend more time on civic related activities than those who are married on weekdays but on weekend days those who are married or have partners spend almost a minute longer doing civic related activities than those who are single. Both groups allocate approximately the same amount of time to helping other households informally on weekdays but on weekend days those who are married or who have partners allocate nearly 8 minutes more than those who are single, separated or widowed to informally helping other households.

Time allocated to playing sports and getting physical exercise on weekend days varies significantly ($p<0.1$) from 17 minutes for those who are married or have a partner to 4 minutes for those who are single, separated or widowed. On weekdays, farm household members who are single, separated or widowed allocate more time to playing sports and getting physical exercise than those who are married, though the difference in time allocated to sports and exercise on weekdays is not significantly different. On weekdays time allocated to attending sports related activities varies significantly ($p<0.1$) by marital status. Farm household members who are married allocate 5 minutes more to attending sports related activities compared to those who are single, separated or widowed. On weekend days respondents who are single allocate 5 minutes more to attending sports related activities than those who are married but the difference is not statistically significant. One possible explanation for this result is that married respondents are more likely to have children and children do sporting activities during the week to which their parents attend and spectate. At the aggregate level, there is little difference in the time allocated to sports, exercise and leisure activities by marital status on weekend days. On weekend days, however, respondents who are married or have partners spend approximately 7 minutes more playing sports, exercising and on leisure activities than their single counterparts.

Variations in time allocated to watching television and listening to the radio by marital status are statistically significant ($p<0.05$) for weekdays only. Farm household members who are married allocate over half an hour less to watching television and listening to the radio on weekdays than those who are single, separated or widowed. On weekend days respondents who are single, separated or widowed allocate 6 minutes more to watching television and listening to the radio than those who are married though the difference is not significant. Respondents who are married or have partners spend 7 minutes more than those who are single, separated or widowed reading on weekdays and on weekend days, though the differences in time allocation between the two groups are not significantly different.

Table 7-5 Average Daily Duration of Activities in Minutes by Gender and Marital Status

Activity Group	Activity	Weekday									Weekend								
		All Persons			Men			Women			All Persons			Men			Women		
		Married/ Partner	Single/ Separated/ Widowed	Sig.	Married/ Partner	Single/ Separated/ Widowed	Sig.	Married/ Partner	Single/ Separated/ Widowed	Sig.	Married/ Partner	Single/ Separated/ Widowed	Sig.	Married/ Partner	Single/ Separated/ Widowed	Sig.	Married/ Partner	Single/ Separated/ Widowed	Sig.
Personal Care/ Resting	Personal Care/ Resting/ Sleeping	588.5	604.1	ns	586.4	586.3	ns	591.5	703.5	ns	629.3	621.7	ns	626.1	613.9	ns	634.0	664.5	ns
Travel	Travel	35.2	33.6	ns	30.4	34.0	ns	42.3	31.5	ns	35.1	34.6	ns	37.8	30.3	ns	31.2	58.5	ns
Paid Employment or Study	Paid Employment	132.0	110.2	ns	139.4	129.9	ns	121.1	0.0	ns	22.9	12.2	ns	26.5	14.5	ns	17.5	0.0	ns
	Study/ Education	**0.3**	**2.3**	**	**0.5**	**2.7**	**	**0.0**	**0.0**	**	0.2	2.3	ns	0.0	0.0	ns	0.6	0.0	ns
	Breaks from Work/ Study	25.2	26.8	ns	31.4	30.5	ns	8.7	15.0	ns	**18.5**	**28.6**	*	**25.0**	**31.1**	*	**8.9**	**15.0**	*
Farm Related Activities	Planting/ Harvesting/ Picking/ Weeding	23.2	25.0	ns	31.3	28.9	ns	11.4	3.0	ns	17.6	15.5	ns	26.8	18.3	ns	3.9	0.0	ns
	Farming of Animals	**143.8**	**200.0**	***	**212.5**	**210.8**	***	**42.9**	**139.5**	***	**125.4**	**177.5**	***	**187.5**	**184.4**	***	**33.1**	**139.5**	***
	Farm Maintenance	64.2	61.1	ns	104.0	72.1	ns	5.9	0.0	ns	38.6	46.4	ns	62.9	54.3	ns	2.5	3.0	ns
	Administration Related to Farming	10.4	13.4	ns	11.9	12.6	ns	8.2	18.0	ns	5.9	4.4	ns	7.2	5.2	ns	3.9	0.0	ns
	Non-Paid Activities Related to Farming	**1.1**	**0.9**	*	**1.3**	**1.1**	*	**0.8**	**0.0**	*	3.1	0.0	ns	3.6	0.0	ns	2.3	0.0	ns
Housework & Other Household Tasks	Cooking & Food Preparation	51.3	33.2	ns	16.9	30.3	ns	101.8	49.5	ns	63.1	45.5	ns	22.9	40.1	ns	122.9	75.0	ns
	Housework	51.2	30.0	ns	7.1	15.0	ns	116.0	114.0	ns	34.7	27.5	ns	6.0	18.0	ns	77.5	79.5	ns
	Other Domestic Work inc. DIY, House Repairs etc.	21.8	20.7	ns	13.7	14.5	ns	33.6	55.5	ns	19.7	17.3	ns	22.1	16.6	ns	16.2	21.0	ns
Shopping & Appointment	Shopping/ Errands/ Appointments	27.1	22.7	ns	14.0	24.1	ns	46.3	15.0	ns	28.3	40.4	ns	12.4	36.8	ns	51.9	60.0	ns
Caring for Others	Childcare	**24.5**	**2.3**	***	**11.6**	**1.6**	***	**43.3**	**6.0**	***	20.1	4.2	ns	8.5	1.9	ns	37.3	16.5	ns
	Caring for Adults	18.2	6.8	ns	10.0	8.0	ns	30.2	0.0	ns	12.5	4.6	ns	9.7	5.5	ns	16.5	0.0	ns
Voluntary	Civic Activities	7.1	13.6	ns	7.4	16.1	ns	6.7	0.0	ns	11.4	10.2	ns	11.4	12.0	ns	11.5	0.0	ns
	Informal Help to Other Households	11.3	11.6	ns	14.6	12.3	ns	6.5	7.5	ns	3.7	0.9	ns	3.1	1.1	ns	4.6	0.0	ns
Religious Activities	Religious Activity	**5.0**	**1.4**	**	**3.9**	**0.0**	**	**6.7**	**9.0**	**	**37.4**	**25.6**	**	**36.0**	**25.4**	**	**39.6**	**27.0**	**
Socialising/ Communicating/ Going Out	Spending Time/ Chatting with Family/ Friends/ Neighbours	38.3	36.8	ns	38.2	31.3	ns	38.5	67.5	ns	61.1	30.9	ns	56.1	60.8	ns	68.5	61.5	ns
	Phoning/ Texting/ Family, Friends or Neighbours	8.4	6.1	ns	7.0	3.2	ns	10.4	22.5	ns	7.4	11.3	ns	4.0	11.2	ns	12.5	12.0	ns
	Eating Out/ Going Out	10.2	12.3	ns	12.5	13.7	ns	6.8	4.5	ns	47.4	62.3	ns	58.8	73.6	ns	30.4	0.0	ns
Sports/ Exercise/ Leisure	Playing Sports/ Physical Exercise	9.6	17.3	ns	4.8	19.3	ns	16.7	6.0	ns	**16.5**	**4.4**	*	**11.6**	**4.1**	*	**23.7**	**6.0**	*
	Productive Exercise	0.6	2.7	ns	0.0	3.2	ns	1.5	0.0	ns	3.1	0.0	ns	3.1	0.0	ns	3.1	0.0	ns
	Attending Sports Related Activities	**4.5**	**0.0**	*	**4.8**	**0.0**	*	**4.2**	**0.0**	*	20.5	26.3	ns	26.0	31.1	ns	12.3	0.0	ns
	Computer/ Internet for Personal Use	6.0	3.6	ns	5.3	3.5	ns	7.0	4.5	ns	6.0	4.4	ns	3.5	4.1	ns	9.6	6.0	ns
	Hobbies/ Other Leisure Activities	4.0	1.4	ns	4.0	1.6	ns	4.0	0.0	ns	14.9	18.9	ns	14.0	12.0	ns	16.4	57.0	ns
TV/ Radio	Watching TV/ Listening to the Radio	**90.6**	**121.4**	**	**93.6**	**118.4**	**	**86.2**	**138.0**	**	106.2	112.9	ns	104.6	118.4	ns	108.5	82.5	ns
	Reading	25.3	18.6	ns	21.6	16.1	ns	30.8	33.0	ns	28.6	21.7	ns	22.4	15.6	ns	37.9	55.5	ns
Other	Other	1.2	0.0	ns	0.0	0.0	ns	2.9	0.0	ns	0.9	0.0	ns	0.0	0.5	ns	0.0	1.5	ns

Note. ns = not significant. Using Mann-Whitney *U* tests, comparisons in bold are significantly different at * p<0.1, **p<0.05, *** p<0.01

7.4.2 Time Use Patterns and the Presence and Number of Children

Almost three quarters of the farm household members that were surveyed have children. Farm household members (all respondents) have an average of three children each. It is well documented in the literature that the presence and number of children has a high cost to parents in terms of time (Hallberg and Klevmarken, 2003; Craig and Bittman, 2005). Time allocated to market work, farm work, work in the home and all types of leisure activities are likely to be highly dependent on the presence and number of children in the household. Therefore, this section examines the allocation of time of farm household members who have children and those who do not have children (Table 7-6). It also looks at the variations in the allocation of time between farm household members who have less than three children and those who have more than three children (Table 7-7).

As expected a priori, there are significant differences in the allocation of time to travel, farm related activities, housework and household related tasks, childcare and passive activities such as reading for those who have children compared to those who do not have children. The number of children farm household members have has a significant effect on time allocated to travel, paid employment (for women), farm related activities, housework and other domestic activities, childcare, helping other households informally, sports exercise and leisure activities and passive activities such as reading (for men only). On weekdays, respondents who do not have children allocate significantly ($p<0.1$) less time (13 minutes less) to travel than those who do have children. This remains significant when gender is controlled for. Interestingly, only on weekend days is the allocation of time to travel significantly ($p<0.01$) greater for those who have more than three children compared to those who have less than three children. A plausible explanation is that farm household members with three or more children have to spend more time driving children to and from school and to and from extra curricular activities, particularly on weekend days. The allocation of time to paid employment is statistically significantly ($p<0.1$) on weekdays but for females only. Women with three or more children allocate 35 minutes less to paid employment on weekdays compared to those with less than three children.

On weekdays, farm household members without children allocate significantly ($p<0.05$) more time to planting, harvesting, picking and weeding and to farming of animals than those with children. On weekend days, farm household members without children also allocate significantly ($p<0.05$) more time to farming of animals than those with children. Those with less than three children spend significantly more time planting, harvesting, picking and weeding on weekdays and weekend days than those with three or more children. Farm household members with children spend significantly more time cooking and preparing food ($p<0.1$), doing housework ($p<0.05$) and doing other domestic activities ($p<0.05$) on weekdays than those without children. When gender is controlled for these results remain significant. Number of children has a significant ($p<0.05$) effect on time allocated to DIY and other domestic activities on weekend days only. Respondents with children spend significantly more time on childcare activities on weekdays ($p<0.01$) and on weekend days ($p<0.05$) than those without children. These variations are consistent and significant when gender is controlled for. Farm household members with less than three children spend significantly ($p<0.01$) less time on childcare on weekend days than those with three or more children. When gender is controlled for, the difference is only significant for women's allocation of time to childcare.

On weekdays farm household members without children allocate 1 minute more to civic related activities and 2 minutes more to informally helping other households than those without children, though the differences in time allocation are not statistically significant. On weekend days though, respondents with children allocate 5 minutes more time to civic related activities and 3 minutes more time to informally helping other households than those without children. Number of children has a significant ($p<0.05$) effect on the time allocated to informally helping other households on weekend days only. Respondents with three or more children allocate 3 minutes more time to helping other households informally if they have three or more children compared to those with less than three children.

On average, respondents with children allocate more time to chatting with family and friends, phoning and texting friends and neighbours, productive exercise, attending sports related activities, computer and internet use and hobbies on weekdays than those without children. On weekend days, respondents without children allocate more time to chatting with family

and friends, eating out and going out, attending sports related activities, computer and internet use and hobbies and other leisure activities than those with children. Number of children has a significant ($p<0.05$) positive effect on time allocated to productive exercise on weekdays and a significant ($p<0.1$) negative effect on time allocated to productive exercise on weekend days. Women with less than three children spend significantly ($p<0.05$) more time using the computer or the internet for personal use on weekdays and weekend days than women with three or more children. Farm household members without children spend more time watching television and listening to the radio on weekdays and on weekend days, though having children has the opposite effect on the time allocated to reading. Respondents with children spend more time (10 minutes more) reading than those without children on weekdays and significantly ($p<0.01$) more time reading on weekend days than those without children.

Table 7-6 Average Daily Duration of Activities in Minutes by Gender and Presence of Children

Activity Group	Activity	Weekday									Weekend								
		All Persons			Men			Women			All Persons			Men			Women		
		Children	No Children	Sig.	Children	No Children	Sig.	Children	No Children	Sig.	Children	No Children	Sig.	Children	No Children	Sig.	Children	No Children	Sig.
Personal Care/ Resting	**Personal Care/ Resting/ Sleeping**	591.5	595.2	ns	587.2	584.7	ns	598.1	642.5	ns	627.4	627.5	ns	623.3	619.7	ns	633.6	662.5	ns
Travel	**Travel**	**31.9**	**45.0**	*	**26.1**	**43.6**	*	**39.6**	**51.3**	*	34.9	35.2	ns	37.4	30.8	ns	31.0	55.0	ns
Paid Employment or Study	**Paid Employment**	121.8	140.5	ns	141.7	124.4	ns	91.2	212.5	ns	22.8	12.7	ns	28.5	10.0	ns	14.0	25.0	ns
	Study/ Education	0.5	1.8	ns	0.8	2.2	ns	0.0	0.0	ns	0.2	1.8	ns	0.0	0.0	ns	0.6	0.0	ns
	Breaks from Work/ Study	24.1	30.0	ns	30.8	23.6	ns	10.1	5.0	ns	21.3	20.2	ns	28.5	23.6	ns	10.3	5.0	ns
Farm Related Activities	**Planting/ Harvesting/ Picking/ Weeding**	**20.9**	**31.8**	**	**27.0**	**38.3**	**	**11.7**	**2.5**	**	15.5	21.6	ns	23.3	25.6	ns	3.4	3.8	ns
	Farming of Animals	**148.0**	**187.5**	**	**211.4**	**213.1**	**	**50.8**	**72.5**	**	**129.5**	**164.8**	**	**186.5**	**186.4**	**	**41.7**	**67.5**	**
	Farm Maintenance	64.4	60.7	ns	103.5	71.9	ns	4.5	10.0	ns	37.2	50.2	ns	59.7	60.8	ns	2.6	2.5	ns
	Administration Related to Farming	10.6	12.7	ns	11.3	13.9	ns	9.6	7.5	ns	6.5	2.7	ns	8.1	3.3	ns	4.0	0.0	ns
	Non-Paid Activities Related to Farming	1.1	0.9	ns	1.3	1.1	ns	0.8	0.0	ns	3.1	0.0	ns	3.6	0.0	ns	2.4	0.0	ns
Housework & Other Household Tasks	**Cooking & Food Preparation**	**52.4**	**30.0**	*	**18.8**	**26.7**	*	**103.8**	**45.0**	*	64.6	41.4	ns	25.9	33.9	ns	124.2	75.0	ns
	Housework	**53.5**	**23.4**	**	**8.6**	**11.9**	**	**122.1**	**75.0**	**	35.9	24.1	ns	7.1	15.8	ns	80.3	61.3	ns
	Other Domestic Work inc. DIY, House Repairs etc.	**24.5**	**12.5**	**	**15.6**	**10.3**	**	**38.2**	**22.5**	**	18.7	20.2	ns	22.2	16.4	ns	13.4	37.5	ns
Shopping & Appointment	**Shopping/ Errands/ Appointments**	26.7	23.9	ns	14.5	23.3	ns	45.4	26.3	ns	28.3	40.2	ns	16.4	28.6	ns	46.6	92.5	ns
Caring for Others	**Childcare**	**24.6**	**1.8**	***	**12.2**	**0.0**	***	**43.6**	**10.0**	***	**21.5**	**0.5**	**	**9.1**	**0.6**	**	**40.5**	**0.0**	**
	Caring for Adults	16.5	11.6	ns	7.1	14.2	ns	31.0	0.0	ns	10.7	9.8	ns	6.7	11.9	ns	17.0	0.0	ns
Voluntary	**Civic Activities**	8.6	9.1	ns	10.0	10.6	ns	6.4	2.5	ns	12.4	7.3	ns	12.8	8.9	ns	11.8	0.0	ns
	Informal Help to Other Households	10.8	13.2	ns	13.7	14.2	ns	6.2	8.8	ns	3.7	0.9	ns	3.1	1.1	ns	4.7	0.0	ns
Religious Activities	**Religious Activity**	5.0	1.4	ns	3.4	0.8	ns	7.4	3.8	ns	36.3	29.1	ns	34.6	28.1	ns	38.9	33.8	ns
Socialising/ Communicating/ Going Out	**Spending Time/ Chatting with Family/ Friends/ Neighbours**	39.1	34.6	ns	36.5	34.7	ns	43.1	33.8	ns	58.8	67.5	ns	52.6	68.6	ns	68.5	62.5	ns
	Phoning/ Texting/ Family, Friends or Neighbours	8.9	4.8	ns	7.4	2.2	ns	11.1	16.3	ns	8.9	6.8	ns	6.8	5.3	ns	12.2	13.8	ns
	Eating Out/ Going Out	7.8	19.6	ns	10.8	17.5	ns	3.1	28.8	ns	49.0	57.3	ns	63.7	63.3	ns	26.5	30.0	ns
Sports/ Exercise/ Leisure	**Playing Sports/ Physical Exercise**	9.5	17.5	ns	4.8	19.7	ns	16.8	7.5	ns	14.7	9.8	ns	8.9	10.0	ns	23.7	8.8	ns
	Productive Exercise	1.5	0.0	ns	1.5	0.0	ns	1.6	0.0	ns	2.5	1.8	ns	3.1	0.0	ns	1.6	10.0	ns
	Attending Sports Related Activities	4.2	0.9	ns	4.2	1.1	ns	4.3	0.0	ns	18.3	32.7	ns	21.9	40.0	ns	12.6	0.0	ns
	Computer/ Internet for Personal Use	5.5	5.0	ns	5.5	3.1	ns	5.7	13.8	ns	5.1	7.1	ns	3.9	3.3	ns	6.9	23.8	ns
	Hobbies/ Other Leisure Activities	3.5	2.7	ns	3.7	2.2	ns	3.3	5.0	ns	15.6	16.8	ns	14.0	11.9	ns	18.2	38.8	ns
TV/ Radio	**Watching TV/ Listening to the Radio**	96.2	105.0	ns	96.7	112.5	ns	95.3	71.3	ns	104.2	118.4	ns	104.5	118.9	ns	103.8	116.3	ns
	Reading	26.3	15.7	ns	23.9	10.8	ns	30.0	37.5	ns	**31.5**	**13.4**	***	**23.5**	**13.1**	***	**43.8**	**15.0**	***
Other	**Other**	0.7	1.4	ns	0.0	0.0	ns	1.8	7.5	ns	0.9	0.0	ns	0.5	0.0	ns	1.6	0.0	ns

Note. ns = not significant. Using Mann-Whitney *U* tests, comparisons in bold are significantly different at * p<0.1, ** p<0.05, *** p<0.01

Table 7-7 Average Daily Duration of Activities in Minutes by Gender and Number of Children

Activity Group	Activity	Weekday									Weekend								
		All Persons			Men			Women			All Persons			Men			Women		
		<3	≥3	Sig.	<3	≥3	Sig.	<3	≥3	Sig.	<3	≥3	Sig.	<3	≥3	Sig.	<3	≥3	Sig.
Personal Care/ Resting	Personal Care/ Resting/ Sleeping	568.0	601.0	ns	555.0	596.9	ns	590.4	609.4	ns	628.9	626.9	ns	626.9	620.6	ns	632.4	639.5	ns
Travel	Travel	27.1	37.5	ns	20.9	35.1	ns	37.8	42.4	ns	**14.1**	**42.4**	***	**6.3**	**45.1**	***	27.6	36.9	ns
Paid Employment or Study	Paid Employment	138.8	122.2	ns	142.0	134.4	ns	**133.2**	**97.5**	*	37.1	14.2	ns	43.6	15.6	ns	25.8	11.4	ns
	Study/ Education	0.0	1.1	ns	0.0	1.6	ns	0.0	0.0	ns	0.4	0.1	ns	0.0	0.0	ns	1.2	0.2	ns
	Breaks from Work/ Study	**31.5**	**23.5**	***	35.6	29.2	ns	**24.6**	**12.0**	**	23.4	20.2	ns	29.3	26.1	ns	13.2	8.1	ns
Farm Related Activities	Planting/ Harvesting/ Picking/ Weeding	**34.6**	**19.8**	*	**54.8**	**22.4**	**	0.0	14.5	ns	**24.3**	**14.5**	*	**36.3**	**19.9**	*	3.6	3.3	ns
	Farming of Animals	146.5	162.1	ns	206.2	213.8	ns	43.8	57.7	ns	123.8	143.7	ns	181.1	188.3	ns	25.2	53.1	ns
	Farm Maintenance	62.0	64.0	ns	**98.0**	**92.1**	*	0.0	7.3	ns	45.4	38.8	ns	71.9	56.1	ns	0.0	3.6	ns
	Administration Related to Farming	9.3	11.8	ns	12.2	12.1	ns	4.2	11.3	ns	9.0	4.2	ns	11.5	4.9	ns	4.8	2.9	ns
	Non-Paid Activities Related to Farming	0.9	1.1	ns	0.4	1.5	ns	1.8	0.2	ns	1.8	2.5	ns	1.4	2.8	ns	2.4	1.9	ns
Housework & Other Household Tasks	Cooking & Food Preparation	51.6	45.0	ns	**27.2**	**19.3**	**	**93.6**	**96.8**	*	62.0	57.5	ns	27.6	28.7	ns	121.2	116.0	ns
	Housework	60.2	40.8	ns	**14.0**	**8.3**	**	139.8	106.4	ns	32.7	33.0	ns	**9.8**	**9.8**	**	72.0	80.0	ns
	Other Domestic Work inc. DIY, House Repairs etc.	24.5	20.4	ns	16.7	13.0	ns	37.8	35.4	ns	**26.9**	**16.3**	**	30.4	17.0	ns	**21.0**	**15.0**	**
Shopping & Appointment	Shopping/ Errands/ Appointments	29.3	24.8	ns	18.8	16.7	ns	47.4	41.0	ns	34.2	30.3	ns	22.7	19.5	ns	54.0	52.4	ns
Caring for Others	Childcare	20.5	18.3	ns	11.9	7.2	ns	35.4	40.6	ns	**15.2**	**16.4**	***	8.4	5.7	ns	**27.0**	**38.1**	**
	Caring for Adults	13.2	16.0	ns	10.8	8.8	ns	17.4	30.5	ns	7.7	11.5	ns	8.0	8.4	ns	7.2	17.6	ns
Voluntary	Civic Activities	2.7	10.9	ns	1.4	13.1	ns	4.8	6.3	ns	19.0	8.3	ns	14.7	10.6	ns	26.4	3.8	ns
	Informal Help to Other Households	12.8	10.9	ns	14.7	13.6	ns	9.6	5.4	ns	**0.9**	**3.8**	**	**1.4 ***	**2.8 ***	*	**0.0**	**5.7**	*
Religious Activities	Religious Activity	2.9	4.5	ns	2.4	2.7	ns	3.6	8.2	ns	37.1	33.5	ns	31.1	33.1	ns	47.4	34.5	ns
Socialising/ Communicating/ Going Out	Spending Time/ Chatting with Family/ Friends/ Neighbours	38.8	37.6	ns	38.7	35.0	ns	39.0	42.9	ns	51.6	64.4	ns	42.9	62.6	ns	66.6	68.1	ns
	Phoning/ Texting/ Family, Friends or Neighbours	12.8	6.1	ns	10.8	4.1	ns	16.2	10.1	ns	9.9	7.9	ns	7.0	6.1	ns	15.0	11.4	ns
	Eating Out/ Going Out	9.0	11.4	ns	14.3	12.4	ns	0.0	9.1	ns	53.2	50.4	ns	64.2	63.4	ns	34.2	24.1	ns
Sports/ Exercise/ Leisure	Playing Sports/ Physical Exercise	9.5	12.3	ns	3.8	11.4	ns	19.2	14.1	ns	11.0	14.3	ns	2.8	11.4	ns	25.2	20.2	ns
	Productive Exercise	**0 ****	**1.6 ****	**	0.0	1.4	ns	0.0	1.9	ns	**6.6**	**0.8**	*	8.4	0.0	ns	3.6	2.4	ns
	Attending Sports Related Activities	3.3	3.4	ns	5.2	2.6	ns	0.0	5.2	ns	19.6	22.8	ns	24.4	28.7	ns	11.4	10.7	ns
	Computer/ Internet for Personal Use	6.6	5.0	ns	2.8	5.4	ns	**13.2**	**4.2**	**ns**	5.3	5.7	ns	0.0	4.9	ns	**14.4**	**7.1**	**
	Hobbies/ Other Leisure Activities	5.7	2.5	ns	6.3	2.2	ns	4.8	3.1	ns	13.0	17.0	ns	15.0	12.8	ns	9.6	25.5	ns
TV/ Radio	Watching TV/ Listening to the Radio	95.1	99.6	ns	94.9	104.0	ns	95.4	90.7	ns	87.4	115.1	ns	87.6	116.3	ns	87.0	112.9	ns
	Reading	22.7	23.9	ns	**20.2**	**19.7**	*	27.0	32.6	ns	36.8	23.3	ns	25.8	18.3	ns	55.8	33.6	ns
Other	Other	0.0	1.2	ns	0.0	0.0	ns	0.0	3.5	ns	1.8	0.3	ns	0.0	0.5	ns	4.8	0.0	ns

Note. ns = not significant. Using Mann-Whitney *U* tests, comparisons in bold are significantly different at * p<0.1, ** p<0.05, *** p<0.01

7.5 Time Use Patterns, Farm Characteristics and Seasonal Variation

The family characteristics marriage and parenthood examined in Section 7.4 are described by Robinson (1999b) as role factors, since they imply strong commitments of time. In this sense, farm size can also be considered a role factor, as farms require farm household members, particularly farm operators, to dedicate large quantities of time to working on them. The commitment of time that farms require affect not only the allocation of time of farm household members to farm work and off-farm work, but also the allocation of time to the activities that farm household members do in their free time. Therefore, farm size is an extremely important factor to control and adjust for when examining variations and trends in time allocation of farm household members. Furthermore, farm household members' allocation of time, particularly to agricultural, leisure and recreational pursuits, is subject to wide seasonal variation. Therefore, the patterns of time use for all activities across the four seasons are examined in Section 7.5.2.

7.5.1 Time Use Patterns and Farm Size

As discussed in Section 5.4.5, respondents of the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey* live on farms of an average of 34.1 hectares (or UAA). Table 7-8 shows the average time use of farm household members in each of the thirty activities by gender and compares the average time use of those who live on farms that are greater than or equal to the average farm size or less than the average farm size. On weekend days, respondents living on farms that are less than 34.1 hectares allocate significantly ($p<0.01$) more time (1 hour, 10 minutes more) to personal care, resting and sleeping than those living on farms that are greater than or equal to 34.1 hectares. Controlling for gender, the relationship between farm size and time allocated to personal care, resting and sleeping on weekend days remains statistically significant. On weekdays, respondents living on farms that are less than 34.1 hectares allocate significantly more time (33 minutes more) to personal care, resting and sleeping than those living on farms that are greater than or equal to 34.1 hectares though the difference is not statistically significant.

As was expected a priori, respondents living on farms that are greater than or equal to 34.1 hectares spend more time on all farm related activities than those living on farms that are less than 34.1 hectares. On weekdays, respondents living on farms that are greater than or equal to 34.1 hectares allocate significantly ($p<0.1$) more time to farming of animals and significantly ($p<0.05$) less time to paid employment than those living on farms that are less than 34.1 hectares. On weekend days, respondents living on farms that are greater than or equal to 34.1 hectares allocate significantly ($p<0.1$) more time to farming of animals than those living on farms that are less than 34.1 hectares, though there is no significant difference in time allocated to paid employment on weekend days. In particular, men living on farms that are greater than or equal to 34.1 hectares spend significantly ($p<0.01$) less time (1 hour, 17 minutes less) on paid employment and significantly ($p<0.05$) more time (42 minutes more) farming animals on weekdays than men living on smaller farms. There is a significant difference in time allocation across farm size in non-paid activities related to farming such as attending meetings run by farm organisations. Farm household members living on larger farms spend significantly ($p<0.1$) more time attending meetings on weekdays compared to those living on smaller farms. It is possible that farm household members living on larger farms attend more meetings and activities related to farming such as IFA meetings.

On weekdays and weekend days, respondents living on farms of greater than or equal to 34.1 hectares spend significantly ($p<0.01$) more time (11 minutes more on weekdays, 6 minutes more on weekend days) doing domestic work such as DIY and house repairs than those living on smaller farms. Controlling for gender, the results remain significant for weekdays only. Farm household members living on farms smaller than 34.1 hectares allocate significantly ($p<0.05$) more time to civic related activities on weekdays than those living on farms that are greater than or equal to 34.1 hectares. After controlling for gender, the difference in time allocation only remains significant for men, with men living on smaller farms allocating 10 minutes more to civic related activities than their counterparts living on larger farms. On weekend days, respondents' living on farms that are greater than or equal to 34.1 hectares allocate 10 minutes more to civic related activities than those living on farms smaller than 34.1 hectares, though the difference is not statistically different. Farm household members living on farms that are smaller than 34.1 hectares allocate more time to informally helping other households on weekdays and weekend days than those living on farms that are greater

than or equal to 34.1 hectares. They spend 3 minutes more on weekdays and 2 minutes more on weekend days helping other household informally, though this is not statistically significant. It is likely that operators and non-operators of large farms have less flexibility in supplying time to off-farm non-market activities, such as volunteering, than those living on smaller farms do, due to the larger time commitment required on larger farms.

Farm household members living on farms that are smaller than 34.1 hectares allocate more time to chatting with their family and friends and phoning and texting their family and friends on weekdays and on weekend days than those living on larger farms. Conversely, respondents living on farms that are larger than the average allocate more time to eating and going out on weekdays and on weekend days. On weekend days there are significant differences in time allocated to computer and internet use and hobbies and other leisure activities by farm size. Respondents living on farms of greater than or equal to 34.1 hectares spend significantly ($p<0.1$) more time (4 minutes more) using the computer or internet for personal use and allocate significantly ($p<0.05$) more time (12 minutes more) to hobbies and other leisure activities than those living on smaller farms. Controlling for gender, these results remain significant for men only. A plausible explanation is that those living on larger farms do not participate in paid employment and therefore can minimise their farm related work on weekend days and make more time available for the participation in hobbies and other leisure activities than those living on smaller farms and working off the farm.

Respondents living on larger farms spend significantly ($p<0.01$) more time (14 minutes more) reading on weekdays than farm household members living on farms that are smaller than 34.1 hectares. There is also a significant ($p<0.05$) difference in the time that men allocate to reading on weekdays compared to women. Farm household members living on farms that are greater than or equal to 34.1 hectares allocate 12 minutes ($p<0.1$) more than those living on farms smaller than 34.1 hectares to reading on weekend days. These results only remain significant for men when gender is controlled for. A possible reason for this is that those on smaller farms spend more time in paid employment. Thus, they have less time available for passive leisure activities such as reading.

Table 7-8 Average Daily Duration of Activities in Minutes by Gender and Size (or AAU) of Farm

Activity Group	Activity	Weekday									Weekend								
		All Persons			Men			Women			All Persons			Men			Women		
		<34.1ha	≥34.1ha	Sig.	<34.1ha	≥34.1ha	Sig.	<34.1ha	≥34.1ha	Sig.	<34.1ha	≥34.1ha	Sig.	<34.1ha	≥34.1ha	Sig.	<34.1ha	≥34.1ha	Sig.
Personal Care/ Resting	Personal Care/ Resting/ Sleeping	606.5	574.0	ns	600.5	567.8	ns	618.3	585.8	ns	**657.7**	**587.7**	***	**655.3**	**577.8**	**	**662.5**	**606.2**	**
Travel	Travel	32.6	37.7	ns	29.9	33.9	ns	38.1	45.0	ns	33.5	37.0	ns	34.0	37.2	ns	32.5	36.5	ns
Paid Employment or Study	Paid Employment	**147.2**	**99.4**	**	**169.6**	**92.2**	***	103.2	113.1	ns	24.3	14.9	ns	26.8	17.1	ns	19.3	10.8	ns
	Study/ Education	0.4	1.3	ns	0.6	2.0	ns	0.0	0.0	ns	**0.0**	**0.4**	*	0.0	0.0	ns	0.0	1.2	ns
	Breaks from Work/ Study	21.3	31.2	ns	26.0	37.1	ns	12.0	20.0	ns	**15.6**	**28.1**	*	**20.2**	**36.0**	*	6.4	13.5	ns
Farm Related Activities	Planting/ Harvesting/ Picking/ Weeding	20.2	28.3	ns	30.5	30.6	ns	**0.0**	**23.9**	***	18.7	14.9	ns	27.3	19.7	ns	1.5	5.8	ns
	Farming of Animals	**141.2**	**180.0**	*	**194.1**	**235.5**	**	37.5	74.6	ns	**118.3**	**165.0**	**	**163.2**	**217.8**	***	28.5	66.2	ns
	Farm Maintenance	50.7	80.2	ns	**74.9**	**118.4**	*	3.3	7.7	ns	40.2	41.0	ns	59.2	61.2	ns	2.1	3.1	ns
	Administration Related to Farming	10.1	12.5	ns	10.7	14.0	ns	9.0	9.6	ns	4.2	7.2	ns	**3.2**	**11.1**	*	6.1	0.0	ns
	Non-Paid Activities Related to Farming	**0.5**	**1.7**	*	0.8	1.8	ns	**0.0**	**1.5**	*	1.6	3.2	ns	**1.2**	**4.1**	*	2.5	1.5	ns
Housework & Other Household Tasks	Cooking & Food Preparation	45.9	47.8	ns	**16.4**	**27.8**	*	103.8	85.8	ns	56.6	61.3	ns	23.0	35.8	ns	124.0	109.2	ns
	Housework	47.0	44.3	ns	9.8	9.5	ns	120.0	110.4	ns	35.9	28.9	ns	11.0	8.2	ns	85.7	67.7	ns
	Other Domestic Work inc. DIY, House Repairs etc.	**16.8**	**27.6**	***	**11.3**	**17.4**	**	**27.6**	**46.9**	*	**16.5**	**22.5**	**	18.4	23.0	ns	12.9	21.5	ns
Shopping & Appointment	Shopping/ Errands/ Appointments	23.5	29.2	ns	16.2	18.7	ns	37.8	49.2	ns	36.4	24.6	ns	24.2	15.0	ns	60.9	42.7	ns
Caring for Others	Childcare	22.3	14.3	ns	9.5	6.9	ns	47.4	28.5	ns	19.1	12.2	ns	9.2	2.7	ns	38.9	30.0	ns
	Caring for Adults	17.2	12.7	ns	7.2	12.2	ns	36.9	13.9	ns	10.1	11.0	ns	6.9	10.3	ns	16.5	12.3	ns
Voluntary	Civic Activities	**11.9**	**4.7**	**	**14.5**	**4.5**	**	6.6	5.0	ns	6.9	16.6	ns	8.0	16.4	ns	4.9	16.9	ns
	Informal Help to Other Households	12.6	9.8	ns	14.9	12.6	ns	8.1	4.6	ns	3.8	2.0	ns	3.5	1.0	ns	4.3	3.9	ns
Religious Activities	Religious Activity	4.2	4.0	ns	2.3	3.0	ns	7.8	5.8	ns	35.8	32.7	ns	34.6	29.8	ns	38.3	38.1	ns
Socialising/ Communicating/ Going Out	Spending Time/ Chatting with Family/ Friends/ Neighbours	43.7	30.4	ns	40.3	30.2	ns	50.4	30.8	ns	65.3	55.5	ns	67.4	44.6	ns	61.2	75.8	ns
	Phoning/ Texting/ Family, Friends or Neighbours	8.3	7.2	ns	7.2	3.9	ns	10.5	13.5	ns	8.6	8.2	ns	6.0	6.8	ns	13.8	10.8	ns
	Eating Out/ Going Out	8.8	13.3	ns	10.9	15.6	ns	4.8	8.9	ns	45.8	58.1	ns	59.1	69.7	ns	**19.3**	**36.5**	*
Sports/ Exercise/ Leisure	Playing Sports/ Physical Exercise	11.3	12.0	ns	8.4	11.0	ns	16.8	13.9	ns	14.4	12.2	ns	9.0	9.5	ns	25.1	17.3	ns
	Productive Exercise	1.9	0.1	ns	1.8	0.0	ns	2.1	0.4	ns	3.3	1.1	ns	3.7	0.0	ns	2.5	3.1	ns
	Attending Sports Related Activities	2.9	4.0	ns	2.6	4.1	ns	3.6	3.9	ns	22.9	20.8	ns	**32.3**	**21.4**	*	4.0	19.6	ns
	Computer/ Internet for Personal Use	5.8	4.9	ns	5.1	4.3	ns	7.2	6.2	ns	**3.5**	**8.3**	*	**1.8**	**6.2**	*	6.7	12.3	ns
	Hobbies/ Other Leisure Activities	3.1	3.6	ns	3.2	3.2	ns	3.0	4.2	ns	**10.7**	**22.8**	**	**8.3**	**20.1**	**	15.6	27.7	ns
TV/ Radio	Watching TV/ Listening to the Radio	104.4	90.5	ns	105.6	96.5	ns	102.0	79.0	ns	108.8	106.6	ns	109.1	108.9	ns	108.1	102.3	ns
	Reading	**17.7**	**31.3**	***	**15.5**	**25.5**	**	**22.2**	**42.3**	**	**21.6**	**33.8**	*	**14.4**	**28.0**	*	36.1	44.6	ns
Other	Other	0.0	2.0	ns	0.0	0.0	ns	0.0	5.8	ns	0.0	1.6	ns	0.0	0.8	ns	0.0	3.1	ns

Note. ns = not significant. Using Mann-Whitney *U* tests, comparisons in bold are significantly different at * p<0.1, ** p<0.05, *** p<0.01

7.5.2 Time Use Patterns and Seasonal Variation

This section examines the allocation of time of farm household members across the four seasons (Table 7-9). As described in Section 5.3.4, data collection for this survey was carried out over the course of a seventeen month period in order to capture seasonal variations in time use. In Ireland, seasonal variation is an important consideration in time use research. Cold wet winters, mild damp summers and temperate spring and autumn seasons affect the time use allocation patterns of all people in the country but, in particular, farm household members. Climatic changes dictate the schedule of farmers and therefore the time that they spend doing various farming related activities. Time is a limited resource and so people face trade-offs in allocating their time. If farm household members spend more time doing farming related activities at certain times of the year then they have less time for other activities. Conversely, during less labour intensive months on the farm, farm household members may have more time available to pursue other activities.

On weekdays, seasonal variation has a significant effect on time allocated to planting, harvesting, picking and weeding, watching television, listening to the radio and reading. On weekend days, time allocated to planting, harvesting, picking and weeding, non-paid activities related to farming, phoning and texting friends and family and eating and going out is significantly different across the four seasons. On weekdays ($p<0.1$) and weekend days ($p<0.05$) farm household members allocate significantly more time to planting, harvesting, picking and weeding in summer and autumn than in winter and spring. Respondents allocate significantly ($p<0.05$) more time to non-paid activities related to farming on weekend days during the months of autumn, winter and spring compared to the summer months when they allocate no time at all to non-paid activities related to farming.

During the months of summer and autumn, farm household members allocate more time to civic related activities on weekdays than during the months of spring and winter. During the months of spring and winter however, farm household members allocate more time to civic related activities on weekend days. Farm household members allocate more time to helping other households informally on weekend days compared to weekdays. On weekdays though, farm household members allocate more time to informally helping other households during the spring and autumn months compared to summer and winter. On weekend days respondents allocate the most time to helping other households informally during the spring

and summer months compared to autumn and winter. Spring and summer are traditionally the busiest months on farms, particularly farms specialising in mixed grazing livestock (of which 53% of households in the sample are). The tradition of méitheal (described in Section 1.2.7), when farmers living in the same area work together to harvest their crops and help one another in business, would therefore be most likely to occur during these busy seasons. The concept of méitheal could therefore explain the increase in time allocated to helping other households informally during the months of spring and summer.

On weekend days there are significant differences in the time allocated to phoning and texting family, friends and neighbours and going out and eating out. Farm household members allocate significantly ($p<0.05$) more time to phoning and texting family and friends during the months of autumn and winter compared to in spring and summer. A similar pattern of time allocation is evident for eating out and going out on weekend days during the months of summer and winter. Respondents allocate significantly ($p<0.1$) more time to going out and eating in the summer and the winter.

Leisure activities such as playing sports and getting physical exercise are allocated more time by farm household members on weekdays and weekend days during the months of spring. Activities such as using computers or the internet for personal use and hobbies and other leisure activities are allocated more time on weekdays and weekend days during the colder and darker months of winter. Time spent watching television and listening to the radio (on weekdays) varies significantly ($p<0.1$) across the seasons. As expected, farm household members allocate more time to watching television and listening to the radio during the months of autumn and winter than they do in spring and summer. This is most likely attributed to the shorter days and colder, wetter weather during the autumn and winter and the probability that there is less work to do on farms during these months when the animals are housed for the winter. There is also a significant ($p<0.1$) difference in the time that farm household members allocate to reading across the four seasons. Respondents spend approximately thirty minutes reading on weekdays during the months of spring, autumn and winter but this falls to about fifteen minutes in the summer.

Table 7-9 Average Daily Duration of Activities in Minutes by Season

Activity Group	Activity	Weekday					Weekend				
		All Persons					All Persons				
		Spring	Summer	Autumn	Winter	Sig.	Spring	Summer	Autumn	Winter	Sig.
Personal Care/ Resting	Personal Care/ Resting/ Sleeping	650.3	628.5	608.7	634.1	ns	624.3	591.6	581.5	581.3	ns
Travel	Travel	35.9	24.9	40.9	36.4	ns	30.9	36.9	36.7	33.5	ns
Paid Employment or Study	Paid Employment	0.6	27.0	30.9	14.6	ns	120.6	104.8	151.2	116.5	ns
	Study/ Education	0.0	0.0	0.2	0.5	ns	0.0	2.0	0.3	1.0	ns
	Breaks from Work/ Study	19.4	22.4	21.8	20.0	ns	23.2	26.2	27.1	24.8	ns
Farm Related Activities	**Planting/ Harvesting/ Picking/ Weeding**	**17.2**	**23.1**	**25.1**	**0.9**	*	**10.2**	**35.9**	**36.9**	**4.0**	**
	Farming of Animals	147.8	127.1	142.3	136.8	ns	188.8	167.5	140.6	147.3	ns
	Farm Maintenance	47.5	70.4	23.6	30.9	ns	58.0	69.7	61.7	64.8	ns
	Administration Related to Farming	3.4	4.3	8.6	4.1	ns	5.1	6.9	14.3	16.0	ns
	Non-Paid Activities Related to Farming	3.8	0.0	0.7	5.5	ns	**1.7**	**0.0**	**1.0**	**1.5**	**
Housework & Other Household Tasks	Cooking & Food Preparation	54.4	57.7	56.0	66.1	ns	49.3	42.0	45.8	50.5	ns
	Housework	34.4	35.1	23.6	42.1	ns	40.8	55.7	44.5	42.8	ns
	Other Domestic Work inc. DIY, House Repairs etc.	11.3	22.4	20.6	20.0	ns	19.5	31.5	18.4	18.0	ns
Shopping & Appointment	Shopping/ Errands/ Appointments	32.8	32.5	30.9	29.8	ns	31.7	22.9	24.1	26.8	ns
Caring for Others	Childcare	2.8	30.3	13.8	16.1	ns	5.7	28.7	18.0	22.0	ns
	Caring for Adults	2.8	6.1	13.3	16.4	ns	3.1	9.1	21.2	23.3	ns
Voluntary	Civic Activities	2.5	21.1	12.6	6.6	ns	14.2	6.9	6.9	8.5	ns
	Informal Help to Other Households	3.8	1.0	4.5	2.3	ns	16.4	14.0	8.4	8.8	ns
Religious Activities	Religious Activity	35.9	28.0	32.8	41.4	ns	1.7	5.3	4.1	5.0	ns
Socialising/ Communicating/ Going Out	Spending Time/ Chatting with Family/ Friends/ Neighbours	55.3	64.6	53.7	71.6	ns	41.3	22.1	41.3	45.5	ns
	Phoning/ Texting/ Family, Friends or Neighbours	10.9	5.3	7.5	10.5	ns	**4.0**	**2.0**	**9.6**	**14.3**	**
	Eating Out/ Going Out	57.8	53.6	59.5	33.2	ns	**0.0**	**14.0**	**11.5**	**16.0**	*
Sports/ Exercise/ Leisure	Playing Sports/ Physical Exercise	24.4	10.4	12.7	9.1	ns	12.5	11.4	12.0	10.3	ns
	Productive Exercise	2.5	2.5	1.4	3.2	ns	3.4	0.0	1.4	0.0	ns
	Attending Sports Related Activities	22.5	22.1	23.6	19.3	ns	0.0	6.9	2.0	5.0	ns
	Computer/ Internet for Personal Use	5.6	4.3	5.6	6.6	ns	6.2	7.1	2.0	8.0	ns
	Hobbies/ Other Leisure Activities	17.8	19.1	8.9	20.9	ns	2.8	3.1	2.5	5.3	ns
TV/ Radio	**Watching TV/ Listening to the Radio**	**106.6**	**80.9**	**124.5**	**111.1**	*	102.7	95.3	87.8	113.3	ns
	Reading	**30.0**	**15.3**	**30.5**	**30.2**	*	22.1	20.6	24.6	26.5	ns
Other	Other	0.0	0.0	2.1	0.0	ns	0.0	0.0	2.5	0.0	ns

Note. ns = not significant. Using Kruskal-Wallis tests, comparisons in bold are significantly different at * p<0.1, ** p<0.05, *** p<0.01

7.6 Time Use Patterns and Community

Locational or geographic factors can also influence the allocation of time. Robinson (1999b) identifies three distinct types of locational factors that affect time use: region of the country, size of community, and type of housing. Interpreting Robinson's locational factors loosely, Sections 7.6.1 to 7.6.3 examine the effect of distance from nearest village or town, community size and the length of time that farm households have resided on their farm or in their communities on the allocation of time.

7.6.1 Time Use Patterns and Distance from Nearest Village or Town

Section 5.4.4 chronicled the household characteristics of the respondents to the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey*. It was determined that farm households are located an average of 5.8 kilometres from the nearest village, town or urban centre. Table 7-10 presents the allocation of time of farm household members who live less than or greater than or equal to 5.8 kilometres from their nearest village, town or urban centre. On weekdays, distance from nearest village, town or urban centre significantly effects the allocation of time to farm maintenance, though for women only. Distance also has a significant effect on the time allocated to watching television and listening to the radio on weekdays. The allocation of time to personal care, resting and sleeping, taking breaks from work or study, planting, harvesting, picking and weeding and watching television and listening to the radio is significantly affected by distance but for weekdays only.

Farm household members living greater than or equal to 5.8 kilometres from their nearest village, town or urban centre allocate significantly ($p<0.1$) less time to personal care, resting and sleeping on weekend days. This relationship only remains statistically significant for men when gender is controlled for. Respondents living greater than or equal to 5.8 kilometres from their nearest village or town spend 1 minute less on breaks from work or study ($p<0.1$) and 21 minutes less on planting, harvesting, picking and weeding ($p<0.1$) on weekend days compared to those who live closer to a village or town. Controlling for gender, the relationship between distance from nearest urban centre and time allocated to breaks from

work or study becomes statistically insignificant though the relationship between distance and time allocated to planting and harvesting remains significant for men only.

Farm household members allocate more time to civic related activities on weekdays and on weekend days if they live less than 5.8 kilometres from their nearest village or urban centre. Farm household members living closer to a village or town allocate 3 minutes more on weekdays and 1 minute more on weekend days to civic related activities than those living further away from villages or towns. On weekdays respondents allocate 1 minute more to helping other households informally if they live less than 5.8 kilometres from the nearest village, town or urban centre. On weekend days however farm household members living more than 5.8 kilometres from the nearest village, town or urban centre allocate 3 minutes more to helping other households informally. On weekdays, respondents living less than 5.8 kilometres from their nearest village or urban centre allocate more time to leisure activities such as playing sports, productive exercise, attending sports related activities and using computers or the internet for personal use than those living further from villages and towns. On weekend days though, farm household members living greater than or equal to 5.8 kilometres from their nearest urban centre allocate more time to productive exercise, attending sports related activities and using computers and the internet for personal use.

On weekdays, respondents living greater than or equal to 5.8 kilometres from their nearest village or town spend 1 hour and 49 minutes watching television or listening to the radio compared to the 1 hour and 32 minutes that those living closer to villages and urban centres allocate to watching television and listening to the radio. The relationship between distance from village or urban centre and time allocated to television viewing and listening to the radio is statistically significant on weekend days ($p<0.05$), though not for men when gender is controlled for. A similar pattern of time allocation to passive activities such as watching television and listening to the radio is evident on weekend days with respondents who live closer to villages or urban centres spending significantly ($p<0.01$) less time on such activities. Across all persons in the sample, farm household members allocate an average of 36 minutes more time to watching television or listening to the radio on weekend days if they live greater than or equal to 5.8 kilometres from the nearest village or town.

Table 7-10 Average Daily Duration of Activities in Minutes by Gender and Distance from Nearest Village or Town

Activity Group	Activity	Weekday									Weekend								
		All Persons			Men			Women			All Persons			Men			Women		
		<5.8km	≥5.8km	Sig.	<5.8km	≥5.8km	Sig.	<5.8km	≥5.8km	Sig.	<5.8km	≥5.8km	Sig.	<5.8km	≥5.8km	Sig.	<5.8km	≥5.8km	Sig.
Personal Care/ Resting	**Personal Care/ Resting/ Sleeping**	596.2	592.6	ns	592.2	579.3	ns	604.5	615.4	ns	**640.0**	**612.0**	*	**629.7**	**613.5**	*	661.7	609.4	ns
Travel	**Travel**	35.0	34.7	ns	30.4	34.3	ns	44.7	35.6	ns	41.4	24.8	ns	39.1	29.0	ns	46.2	17.6	ns
Paid Employment or Study	**Paid Employment**	135.2	114.2	ns	136.2	138.8	ns	133.0	72.0	ns	18.0	24.5	ns	17.9	31.8	ns	**18.2**	**12.0**	**
	Study/ Education	1.3	0.0	ns	1.9	0.0	ns	0.0	0.0	ns	0.0	0.5	ns	0.0	0.0	ns	0.0	1.3	ns
	Breaks from Work/ Study	24.8	25.1	ns	30.5	30.0	ns	12.7	16.7	ns	**21.1**	**19.6**	*	29.0	23.5	ns	4.6	12.9	ns
Farm Related Activities	**Planting/ Harvesting/ Picking/ Weeding**	29.6	11.8	ns	36.1	18.5	ns	16.1	0.4	ns	**24.9**	**4.0**	*	**34.1**	**6.0**	**	5.5	0.4	ns
	Farming of Animals	164.2	146.8	ns	213.2	208.8	ns	61.4	40.8	ns	150.4	119.2	ns	196.2	169.8	ns	53.4	32.6	ns
	Farm Maintenance	59.7	70.9	ns	84.4	112.3	ns	**8.2**	**0.0**	*	40.0	41.4	ns	58.1	64.3	ns	1.7	2.1	ns
	Administration Related to Farming	12.7	8.1	ns	14.9	6.3	ns	8.2	11.1	ns	4.5	7.3	ns	5.6	8.5	ns	2.3	5.1	ns
	Non-Paid Activities Related to Farming	1.4	0.5	ns	1.9	0.0	ns	0.3	1.3	ns	1.9	3.2	ns	2.7	2.0	ns	0.0	5.1	ns
Housework & Other Household Tasks	**Cooking & Food Preparation**	42.3	54.8	ns	19.3	24.8	ns	90.3	106.3	ns	57.1	60.0	ns	28.6	26.8	ns	118.3	117.0	ns
	Housework	41.0	53.2	ns	8.7	11.0	ns	108.7	125.6	ns	30.2	37.0	ns	9.3	11.0	ns	74.4	81.4	ns
	Other Domestic Work inc. DIY, House Repairs etc.	19.1	24.8	ns	14.2	12.8	ns	29.4	45.4	ns	16.0	24.5	ns	18.6	23.5	ns	10.7	26.1	ns
Shopping & Appointment	**Shopping/ Errands/ Appointments**	24.4	29.2	ns	17.8	16.5	ns	38.2	51.0	ns	30.4	33.0	ns	18.1	24.5	ns	56.3	47.6	ns
Caring for Others	**Childcare**	20.6	14.4	ns	8.0	9.3	ns	47.0	23.1	ns	20.9	7.0	ns	6.4	4.5	ns	51.6	11.1	ns
	Caring for Adults	14.0	17.2	ns	9.6	9.0	ns	23.2	31.3	ns	9.4	12.5	ns	10.6	4.3	ns	6.9	26.6	ns
Voluntary	**Civic Activities**	10.0	6.8	ns	13.2	4.8	ns	3.1	10.3	ns	11.9	10.0	ns	12.8	9.5	ns	10.1	10.7	ns
	Informal Help to Other Households	11.4	10.6	ns	12.6	16.0	ns	9.1	1.3	ns	2.0	4.7	ns	2.7	2.0	ns	0.6	9.4	ns
Religious Activities	**Religious Activity**	5.6	1.6	ns	3.8	0.5	ns	9.4	3.4	ns	33.1	37.0	ns	31.1	34.8	ns	37.2	40.7	ns
Socialising/ Communicating/ Going Out	**Spending Time/ Chatting with Family/ Friends/ Neighbours**	35.7	42.3	ns	37.3	33.5	ns	32.3	57.4	ns	66.8	50.7	ns	63.4	47.0	ns	73.9	57.0	ns
	Phoning/ Texting/ Family, Friends or Neighbours	8.6	6.3	ns	7.3	3.0	ns	11.3	12.0	ns	7.7	8.2	ns	6.7	4.3	ns	9.8	15.0	ns
	Eating Out/ Going Out	8.1	14.2	ns	7.8	22.5	ns	8.8	0.0	ns	41.9	66.2	ns	54.3	79.0	ns	15.9	44.1	ns
Sports/ Exercise/ Leisure	**Playing Sports/ Physical Exercise**	11.9	9.8	ns	10.1	7.3	ns	15.6	14.1	ns	15.3	10.6	ns	12.1	4.0	ns	21.9	21.9	ns
	Productive Exercise	1.7	0.2	ns	1.6	0.0	ns	2.0	0.4	ns	2.0	2.8	ns	1.9	2.5	ns	2.3	3.4	ns
	Attending Sports Related Activities	4.2	2.1	ns	3.2	3.3	ns	6.2	0.0	ns	16.3	31.4	ns	18.0	44.8	ns	12.7	8.6	ns
	Computer/ Internet for Personal Use	5.2	5.2	ns	3.8	5.5	ns	8.2	4.7	ns	5.2	6.3	ns	3.3	4.5	ns	9.2	9.4	ns
	Hobbies/ Other Leisure Activities	2.2	5.1	ns	2.2	4.8	ns	2.3	5.6	ns	14.4	17.4	ns	14.0	11.3	ns	15.3	27.6	ns
TV/ Radio	**Watching TV/ Listening to the Radio**	**92.3**	**109.4**	**	99.0	107.5	ns	**78.4**	**112.7**	***	**93.6**	**130.0**	***	**96.8**	**129.8**	***	**86.8**	**130.3**	***
	Reading	21.7	25.9	ns	18.9	20.3	ns	27.5	35.6	ns	22.1	34.7	ns	18.3	24.0	ns	**30.3**	**53.1**	*
Other	**Other**	0.0	2.4	ns	0.0	0.0	ns	0.0	6.4	ns	1.1	0.0	ns	0.6	0.0	ns	2.3	0.0	ns

Note. ns = not significant. Using Mann Whitney *U* tests, comparisons in bold are significantly different at * p<0.1, **p<0.05, *** p<0.01

7.6.2 Time Use Patterns and Community Size

Seventy percent of farm household members live in communities or villages with a population of 500 people or less. Small towns and villages are often portrayed as encompassing close-knit communities with groups of people who interact with each other more often and in closer ways than people in larger communities. Thus, one would expect that an increased feeling of community would lead to more time allocated to participating in community and voluntary activities. In line with this, Table 7-10 presents the results of cross-tabulations of the allocation of time of farm household members living in communities of less than five hundred people and those living in communities of greater than or equal to five hundred people. On weekdays, size of community has a significant effect on time allocated to paid employment, caring for adults, religious activity, hobbies and other leisure activities and time allocated to using computers or the internet for personal use, though for men only. On weekend days, time allocated to taking breaks from work or study and caring for adults are significantly affected by community size.

Farm household members living in communities of greater than or equal to 500 people spend significantly ($p<0.05$) more time (56 minutes more) in paid employment on weekdays than those living in communities of less then 500 people. Respondents living in communities of less than 500 people allocate significantly ($p<0.01$) more time to taking breaks from work or study on weekend days compared to respondents living in larger communities. The time that farm household members allocate to caring for adults is statistically different on weekdays and weekend days for those living in communities of greater than or equal to 500 people and those living in communities of less than 500 people. On weekdays, respondents living in villages or towns with a population of greater than or equal to 500 spend 10 minutes more caring for adults than their counterparts living in smaller communities. On weekend days respondents in villages or towns of 500 people or more allocate 14 minutes more to caring for adults than those in smaller towns and villages.

On weekdays farm household members allocate more time to civic related activities if they live in communities that are greater than or equal to 500 people, though on weekend days the difference in the time allocated to civic related activities between the two groups is negligible.

On both weekdays and weekend days, farm household members living in communities of less than 500 people allocate more time to helping other households informally than those living in communities of greater than or equal to 500 people. A plausible explanation for this is that farm household members living in smaller, tight knit rural communities have a heightened sense of social trust and tend to share a common desire to build strong communities (Veenstra, 2002). Respondents allocate significantly ($p<0.1$) more time to religious activities on weekdays if they live in towns or villages of less than 500 people.

There is very little variation in the time that farm household members from smaller or larger communities allocate to socialising, communicating and going out on weekdays or weekend days. Size of community has very little effect on time allocated to playing sports or getting physical exercise, productive exercise or attending sports related activities on weekdays or weekend days either. Living in a small community does however have a significant positive effect on the time allocated to hobbies and other leisure activities but on weekdays only. Respondents living in communities of 500 people or less allocate more time to watching television or listening to the radio and reading on weekdays than those living in communities of greater than or equal to 500 people. On weekend days, farm household members living in communities of less than 500 people allocate 6 minutes more to reading than those residing in communities of greater than or equal to 500 people.

Table 7-11 Average Daily Duration of Activities in Minutes by Gender and Size of Community

Activity Group	Activity	Weekday									Weekend								
		All Persons			Men			Women			All Persons			Men			Women		
		<500	≥500	Sig.	<500	≥500	Sig.	<500	≥500	Sig.	<500	≥500	Sig.	<500	≥500	Sig.	<500	≥500	Sig.
Personal Care/	Personal Care/ Resting/ Sleeping	596.3	585.4	ns	585.9	588.7	ns	615.8	757.3	ns	635.6	612.5	ns	625.7	622.0	ns	**654.7**	**604.7**	**
Travel	Travel	32.8	39.9	ns	32.1	36.6	ns	**34.0**	**39.9**	**	31.3	43.9	ns	34.7	45.6	ns	24.7	42.8	ns
Paid Employment or Study	Paid Employment	**106.5**	**162.9**	**	**119.1**	**168.9**	*	**82.8**	**147.3**	*	18.4	24.8	ns	18.6	28.9	ns	18.1	22.1	ns
	Study/ Education	1.2	0.0	ns	1.9	0.0	ns	0.0	0.0	ns	0.1	0.4	ns	0.0	0.4	ns	0.3	0.5	ns
	Breaks from Work/ Study	27.2	21.4	ns	33.5	22.8	ns	15.5	22.3	ns	**26.8**	**8.3**	***	**34.0**	**9.7**	***	**13** *	**7.6** *	*
Farm Related Activities	Planting/ Harvesting/ Picking/ Weeding	23.8	19.8	ns	28.1	23.0	ns	**15.5**	**17.7**	*	16.8	18.1	ns	23.8	19.7	ns	3.3	7.9	ns
	Farming of Animals	164.5	143.3	ns	220.9	157.4	ns	58.3	125.3	ns	139.2	135.0	ns	187.9	148.9	ns	45.0	101.6	ns
	Farm Maintenance	64.5	63.2	ns	96.1	73.0	ns	5.0	67.5	ns	45.7	31.3	ns	**68.3**	**35.7**	*	2.0	27.3	ns
	Administration Related to Farming	11.4	11.1	ns	12.4	10.7	ns	9.5	8.5	ns	4.8	3.1	ns	7.6	3.6	ns	5.1	2.7	ns
	Non-Paid Activities Related to Farming	1.0	1.2	ns	1.3	1.2	ns	0.3	0.7	ns	2.1	2.9	ns	2.1	3.4	ns	2.0	3.0	ns
Housework & Other Household Tasks	Cooking & Food Preparation	46.7	48.4	ns	19.8	44.4	ns	97.5	55.2	ns	56.4	65.6	ns	23.0	59.2	ns	120.8	72.8	ns
	Housework	47.8	43.6	ns	10.0	33.3	ns	119.0	59.5	ns	30.5	39.0	ns	7.0	31.1	ns	76.0	49.7	ns
	Other Domestic Work inc. DIY, House Repairs etc.	23.7	17.8	ns	15.9	17.9	ns	38.3	19.6	ns	21.6	14.6	ns	23.4	13.9	ns	18.1	18.9	ns
Shopping & Appointment	Shopping/ Errands/ Appointments	27.7	23.5	ns	20.0	15.0	ns	42.0	25.2	ns	30.5	34.2	ns	20.8	31.9	ns	49.3	44.3	ns
Caring for Others	Childcare	18.1	21.0	ns	7.8	15.0	ns	37.5	24.4	ns	19.3	10.1	ns	9.0	1.9	ns	39.2	13.7	ns
	Caring for Adults	**12.3**	**21.9**	**	6.0	19.3	ns	**24.3**	**24.4**	*	**6.2**	**19.9**	***	**3.3**	**19.9**	**	**11.7**	**16.2**	**
Voluntary	Civic Activities	7.6	11.3	ns	8.4	13.2	ns	6.3	13.8	ns	11.3	11.2	ns	12.4	10.8	ns	9.2	7.4	ns
	Informal Help to Other Households	12.0	10.6	ns	14.3	11.7	ns	7.5	9.0	ns	3.7	1.6	ns	2.8	1.5	ns	5.6	1.5	ns
Religious Activities	Religious Activity	**5.4**	**1.6**	*	3.6	1.2	ns	8.8	1.5	ns	36.6	31.3	ns	35.7	31.1	ns	38.4	36.4	ns
Socialising/ Communicating/ Going Out	Spending Time/ Chatting with Family/ Friends/ Neighbours	38.0	38.5	ns	36.6	36.2	ns	40.5	38.2	ns	62.2	60.9	ns	63.4	59.4	ns	59.8	66.9	ns
	Phoning/ Texting/ Family, Friends or Neighbours	8.2	7.4	ns	5.8	7.2	ns	12.5	10.2	ns	7.5	10.5	ns	4.6	10.6	ns	13.2	11.3	ns
	Eating Out/ Going Out	12.8	5.8	ns	16.5	4.3	ns	6.0	5.1	ns	49.2	52.1	ns	61.5	58.1	ns	25.4	57.8	ns
Sports/ Exercise/ Leisure	Playing Sports/ Physical Exercise	11.7	11.7	ns	11.8	10.7	ns	11.5	13.1	ns	12.7	15.5	ns	7.6	13.9	ns	22.4	20.2	ns
	Productive Exercise	0.4	2.6	ns	0.0	2.5	ns	1.3	3.6	ns	1.9	3.3	ns	2.1	3.8	ns	1.5	4.4	ns
	Attending Sports Related Activities	3.0	4.2	ns	3.3	2.5	ns	2.5	4.4	ns	19.3	18.4	ns	23.8	18.0	ns	10.4	19.4	ns
	Computer/ Internet for Personal Use	7.0	2.3	ns	**6.4**	**2.1**	*	8.3	3.2	ns	4.5	8.0	ns	3.4	5.1	ns	6.6	9.8	ns
	Hobbies/ Other Leisure Activities	**4.0**	**2.1**	*	3.3	2.5	ns	**5.3**	**1.9**	*	13.8	21.0	ns	9.5	21.6	ns	22.1	25.8	ns
TV/ Radio	Watching TV/ Listening to the Radio	99.7	93.9	ns	99.4	95.3	ns	100.3	95.6	ns	101.6	117.8	ns	104.7	111.1	ns	95.6	113.9	ns
	Reading	24.9	21.2	ns	19.8	21.8	ns	34.5	24.2	ns	28.8	22.8	ns	19.5	18.6	ns	46.8	26.6	ns
Other	Other	0.0	2.7	ns	0.0	1.9	ns	0.0	3.6	ns	0.0	2.2	ns	0.0	0.9	ns	0.0	3.0	ns

Note. ns = not significant. Using Mann Whitney *U* tests, comparisons in bold are significantly different at * p<0.1, ** p<0.05, *** p<0.01

7.6.3 Time Use Patterns and Rootedness

Rootedness, measured by the length of a family's residence in a community, is a factor that has rarely been studied in conjunction with time use. As determined in Section 5.4.2, eighty five percent of the farm households in the sample have been residing or farming in their community for fifty years or more and fifty seven percent have been living in their respective communities for one hundred years or more. Presented in Tables 7-13 and 7-14 is the allocation of time of farm household members who have been living or farming in their communities for less than fifty years, between fifty and one hundred years and for one hundred years or more, for weekdays and weekend days respectfully. There is a statistically significant ($p<0.01$) positive relationship between the time allocated to personal care, resting and sleeping and the number of years a respondent has been living or farming in their community on both weekdays and weekend days. When gender is controlled for, the results are significant for men but insignificant for women. Farm household members living or farming in their communities for less than fifty years allocate significantly ($p<0.1$) more time to childcare on weekdays than their counterparts living in their communities for more than fifty years. This relationship becomes insignificant when gender is controlled for.

On weekend days, farm household members residing of farming in their communities for between fifty and one hundred years allocate significantly ($p<0.05$) more time to religious activities compared to those living in their communities for less than fifty years or more than one hundred years. When gender is controlled for, the difference is insignificant for men though, it remains significant for women. On weekend days, farm household members residing or farming in their communities for between fifty and one hundred years also allocate significantly ($p<0.05$) more time to chatting with family, friends and neighbours though, when gender is controlled for the results is significant for men only. Also on weekend days, men residing in their communities for between fifty and one hundred years allocate significantly ($p<0.05$) more time to farming of animals and reading than those farming or residing in their communities for less than fifty years or more than one hundred years.

Table 7-12 Average Daily Duration of Activities in Minutes by Gender and Duration in the Community for Weekdays

Activity Group	Activity	Weekday											
		All Persons				Men				Women			
		<50yrs	50-100yrs	>100yrs	Sig.	<50yrs	50-100yrs	>100yrs	Sig.	<50yrs	50-100yrs	>100yrs	Sig.
Personal Care/ Resting	**Personal Care/ Resting/ Sleeping**	**542.5**	**555.0**	**637.7**	***	**565.0**	**476.3**	**623.6**	***	520.0	660.0	662.5	ns
Travel	**Travel**	35.0	19.3	25.9	ns	20.0	18.8	25.7	ns	50.0	20.0	26.3	ns
Paid Employment or Study	**Paid Employment**	175.0	64.3	94.5	ns	25.0	112.5	103.6	ns	325.0	0.0	78.8	ns
	Study/ Education	0.0	0.0	0.0	ns	0.0	0.0	0.0	ns	0.0	0.0	0.0	ns
	Breaks from Work/ Study	32.5	21.4	10.5	ns	50.0	37.5	12.1	ns	15.0	0.0	7.5	ns
Farm Related Activities	**Planting/ Harvesting/ Picking/ Weeding**	70.0	34.3	11.8	ns	140.0	60.0	17.1	ns	0.0	0.0	2.5	ns
	Farming of Animals	67.5	152.1	166.4	ns	135.0	258.8	200.0	ns	0.0	10.0	107.5	ns
	Farm Maintenance	60.0	64.3	87.3	ns	120.0	112.5	135.0	ns	0.0	0.0	3.8	ns
	Administration Related to Farming	20.0	0.0	5.9	ns	40.0	0.0	3.6	ns	0.0	0.0	10.0	ns
	Non-Paid Activities Related to Farming	0.0	0.0	0.9	ns	0.0	0.0	0.0	ns	0.0	0.0	2.5	ns
Housework & Other Household Tasks	**Cooking & Food Preparation**	10.0	62.1	44.1	ns	0.0	45.0	14.3	ns	20.0	85.0	96.3	ns
	Housework	15.0	120.0	41.4	ns	0.0	15.0	8.6	ns	30.0	260.0	98.8	ns
	Other Domestic Work inc. DIY, House Repairs etc.	5.0	68.6	25.5	ns	0.0	60.0	26.4	ns	10.0	80.0	23.8	ns
Shopping & Appointment	**Shopping/ Errands/ Appointments**	17.5	66.4	16.4	ns	15.0	26.3	10.0	ns	20.0	120.0	27.5	ns
Caring for Others	**Childcare**	**210.0**	**17.1**	**23.6**	*	120.0	30.0	20.7	ns	300.0	0.0	28.8	ns
	Caring for Adults	0.0	0.0	12.7	ns	0.0	0.0	1.4	ns	0.0	0.0	32.5	ns
Voluntary	**Civic Activities**	0.0	0.0	7.7	ns	0.0	0.0	6.4	ns	0.0	0.0	10.0	ns
	Informal Help to Other Households	5.0	0.0	35.0	ns	0.0	0.0	45.0	ns	10.0	0.0	17.5	ns
Religious Activities	**Religious Activity**	0.0	0.0	10.0	ns	0.0	0.0	9.3	ns	0.0	0.0	11.3	ns
Socialising/ Communicating/ Going Out	**Spending Time/ Chatting with Family/ Friends/ Neighbours**	45.0	47.1	33.2	ns	90.0	82.5	27.1	ns	0.0	0.0	43.8	ns
	Phoning/ Texting/ Family, Friends or Neighbours	15.0	4.3	3.6	ns	20.0	0.0	0.0	ns	10.0	10.0	10.0	ns
	Eating Out/ Going Out	30.0	17.1	2.7	ns	0.0	15.0	4.3	ns	60.0	20.0	0.0	ns
Sports/ Exercise/ Leisure	**Playing Sports/ Physical Exercise**	0.0	0.0	6.4	ns	0.0	0.0	4.3	ns	0.0	0.0	10.0	ns
	Productive Exercise	0.0	0.0	1.4	ns	0.0	0.0	0.0	ns	0.0	0.0	3.8	ns
	Attending Sports Related Activities	0.0	0.0	8.2	ns	0.0	0.0	5.7	ns	0.0	0.0	12.5	ns
	Computer/ Internet for Personal Use	12.5	17.1	4.5	ns	5.0	0.0	4.3	ns	20.0	40.0	5.0	ns
	Hobbies/ Other Leisure Activities	10.0	8.6	5.5	ns	0.0	0.0	8.6	ns	20.0	20.0	0.0	ns
TV/ Radio	**Watching TV/ Listening to the Radio**	57.5	75.0	104.1	ns	95.0	75.0	112.1	ns	20.0	75.0	90.0	ns
	Reading	5.0	25.7	13.2	ns	0.0	15.0	10.7	ns	10.0	40.0	17.5	ns
Other	**Other**	0.0	0.0	0.0	ns	0.0	0.0	0.0	ns	0.0	0.0	0.0	ns

Note. ns = not significant. Using Mann Whitney *U* tests, comparisons in bold are significantly different at * p<0.1, ** p<0.05, *** p<0.01

Table 7-13 Average Daily Duration of Activities in Minutes by Gender and Duration in the Community for Weekend Days

Activity Group	Activity	Weekend											
		All Persons				Men				Women			
		<50yrs	50-100yrs	>100yrs	Sig.	<50yrs	50-100yrs	>100yrs	Sig.	<50yrs	50-100yrs	>100yrs	Sig.
Personal Care/ Resting	**Personal Care/ Resting/ Sleeping**	**638.6**	**570.0**	**691.8**	***	**618.8**	**536.3**	**685.7**	**	665.0	615.0	702.5	ns
Travel	**Travel**	47.1	32.1	45.0	ns	45.0	0.0	35.7	ns	50.0	75.0	61.3	ns
Paid Employment or Study	**Paid Employment**	68.6	0.0	5.9	ns	120.0	0.0	7.9	ns	0.0	0.0	2.5	ns
	Study/ Education	0.0	0.0	0.9	ns	0.0	0.0	0.0	ns	0.0	0.0	2.5	ns
	Breaks from Work/ Study	21.4	0.0	12.7	ns	30.0	0.0	20.0	ns	10.0	0.0	0.0	ns
Farm Related Activities	**Planting/ Harvesting/ Picking/ Weeding**	70.7	0.0	11.4	ns	112.5	0.0	17.1	ns	15.0	0.0	1.3	ns
	Farming of Animals	79.3	237.9	119.5	ns	**138.8**	**390.0**	**157.9**	**	0.0	35.0	52.5	ns
	Farm Maintenance	0.0	0.0	54.5	ns	0.0	0.0	84.3	ns	0.0	0.0	2.5	ns
	Administration Related to Farming	0.0	0.0	0.9	ns	0.0	0.0	1.4	ns	0.0	0.0	0.0	ns
	Non-Paid Activities Related to Farming	0.0	0.0	3.6	ns	0.0	0.0	2.9	ns	0.0	0.0	5.0	ns
Housework & Other Household Tasks	**Cooking & Food Preparation**	27.9	66.4	56.8	ns	22.5	52.5	29.3	ns	35.0	85.0	105.0	ns
	Housework	21.4	45.0	20.5	ns	0.0	15.0	7.1	ns	50.0	85.0	43.8	ns
	Other Domestic Work inc. DIY, House Repairs etc.	0.0	32.1	14.5	ns	0.0	18.8	17.9	ns	0.0	50.0	8.8	ns
Shopping & Appointment	**Shopping/ Errands/ Appointments**	36.4	6.4	34.5	ns	15.0	3.8	16.4	ns	65.0	10.0	66.3	ns
Caring for Others	**Childcare**	182.1	0.0	5.0	ns	0.0	0.0	0.0	ns	425.0	0.0	13.8	ns
	Caring for Adults	0.0	0.0	10.5	ns	0.0	0.0	3.6	ns	0.0	0.0	22.5	ns
Voluntary	**Civic Activities**	0.0	0.0	15.9	ns	0.0	0.0	11.4	ns	0.0	0.0	23.8	ns
	Informal Help to Other Households	0.0	0.0	5.0	ns	0.0	0.0	3.6	ns	0.0	0.0	7.5	ns
Religious Activities	**Religious Activity**	**8.6**	**85.7**	**40.0**	**	15.0	63.8	41.4	ns	**0.0**	**115.0**	**37.5**	*
Socialising/ Communicating/ Going Out	**Spending Time/ Chatting with Family/ Friends/ Neighbours**	**19.3**	**165.0**	**59.5**	**	**26.3**	**157.5**	**62.9**	**	**10.0**	**175.0**	**53.8**	**ns**
	Phoning/ Texting/ Family, Friends or Neighbours	4.3	0.0	5.5	ns	0.0	0.0	0.7	ns	10.0	0.0	13.8	ns
	Eating Out/ Going Out	15.0	17.1	35.0	ns	26.3	30.0	55.0	ns	0.0	0.0	0.0	ns
Sports/ Exercise/ Leisure	**Playing Sports/ Physical Exercise**	0.0	12.9	26.4	ns	0.0	0.0	9.3	ns	0.0	30.0	56.3	ns
	Productive Exercise	0.0	0.0	0.9	ns	0.0	0.0	0.0	ns	0.0	0.0	2.5	ns
	Attending Sports Related Activities	77.1	17.1	30.0	ns	135.0	30.0	37.1	ns	0.0	0.0	17.5	ns
	Computer/ Internet for Personal Use	6.4	12.9	3.6	ns	0.0	0.0	2.9	ns	15.0	30.0	5.0	ns
	Hobbies/ Other Leisure Activities	0.0	12.9	7.3	ns	0.0	0.0	10.7	ns	0.0	30.0	1.3	ns
TV/ Radio	**Watching TV/ Listening to the Radio**	102.9	55.7	96.4	ns	120.0	75.0	102.1	ns	80.0	30.0	86.3	ns
	Reading	12.9	70.7	26.4	ns	**15.0**	**69.5**	**15.7**	*	10.0	75.0	45.0	ns
Other	**Other**	0.0	0.0	0.0	ns	0.0	0.0	0.0	ns	0.0	0.0	0.0	ns

Note. ns = not significant. Using Mann Whitney *U* tests, comparisons in bold are significantly different at * p<0.1, ** p<0.05, *** p<0.01

7.7 Summary and Discussion

The primary objective of this chapter was to permit a better understanding of the influence of socioeconomic, family, farm and community characteristics in shaping daily time use and activity patterns of farm household members in the West of Ireland. Since this is a baseline study, the results presented in this chapter can be utilised by future research that seeks to compare the allocation of time across socioeconomic groups or across time. This chapter sets the context for Chapters 8 and 9 which contain a more in-depth analysis of the decisions of farm household members to participate in and the number of hours they allocate to voluntary, civic engagement and leisure activities. Within this context, the rest of this section summarises the key results and overall patterns of the time allocation of farm household members in relation to voluntary, civic engagement and leisure activities. Finally, the important caveats regarding the use of cross-tabulations in this chapter are presented.

Age is significantly negatively related to the allocation of time to watching television and listening to the radio and significantly positively associated with time spent reading. Age does not significantly affect the allocation of time to voluntary activities, socialising, communicating, and going out, sports, exercise or other leisure activities, either on weekdays or weekend days. On average though, the youngest group, those aged between 18 and 25, allocate more time to socialising, going out, playing sport, exercising and doing leisure activities on weekdays and weekend days than any other age group. Consequently, respondents in the youngest age group spend significantly less time watching television, listening to the radio and reading on weekdays and weekend days than those in the older age group. Respondents who are 60 years or more allocate the most time to phoning and texting family, friends and neighbours and the average time allocated to civic related activities is highest amongst those in the 41-60 years of age category. On the other hand, respondents in the 61 years and over category allocate the most time, on average, to helping other households informally.

Time allocated to voluntary activities, socialising, communicating, and going out, sports, exercise and other leisure activities or reading is neither significantly negatively or positively related to level of education. Level of education is however negatively associated with time

allocated to passive leisure activities such as watching television and listening to the radio. Level of household income has a significant positive effect on time allocated to eating out and going out on weekdays only. Household income is not significantly associated with any other voluntary, leisure or social activity. Having an off-farm job is significantly negatively associated with time allocated to helping other households informally, spending time and chatting with family and friends, phoning and texting family and friends, productive exercise and watching television and listening to the radio. The only activity that having an off-farm job is positively associated with is playing sports and exercising but this is for weekend days only. Farm household members without an off-farm job allocate 9 minutes more to helping other households informally on weekdays and 2 minutes longer on weekend days than those with off-farm jobs. Farm household members without an off-farm job allocate 2 minutes more to civic engagement related activities on weekdays but on weekend days those with an off-farm job allocate almost 3 minutes more to civic engagement related activities.

Being married or having a partner is not significantly associated with any voluntary activities or with socialising, communicating or going out. Playing sports or doing physical exercise and attending sports related activities are significantly positively related to being married or having a partner though. Being single, separated or widowed is significantly positively related to watching television and listening to the radio. Farm household members who are married allocate over half an hour less to watching television and listening to the radio on weekdays than those who are single, separated or widowed. On weekend days, respondents who are single, separated or widowed allocate 6 minutes more to watching television and listening to the radio than those who are married, though the difference is not significant. On weekdays, farm household members who are single, separated or widowed allocate more time on civic related activities than those who are married but on weekend days those who are married or have partners spend almost a minute longer doing civic related activities than those who are single. Both groups allocate approximately the same amount of time to helping other households informally on weekdays but on weekend days those who are married or who have partners allocate nearly 8 minutes more than those who are single, separated or widowed to informally helping other households.

There are significant differences in the allocation of time to passive activities such as reading for those who have children compared to those who do not have children. The number of children farm household members have has a significant effect on time allocated to helping other households informally, sports exercise and leisure activities and passive activities such as reading (for men only). Number of children has a significant positive association with the time allocated to informally helping other households on weekend days only. On average, respondents with children allocate more time to chatting with family and friends, phoning and texting friends and neighbours, productive exercise, attending sports related activities, computer and internet use and hobbies on weekdays than those without children. On weekend days, respondents without children allocate more time to chatting with family and friends, eating out and going out, attending sports related activities, computer and internet use and hobbies and other leisure activities than those with children. Number of children has a significant positive effect on time allocated to productive exercise on weekdays and a significant negative effect on time allocated to productive exercise on weekend days. Women with less than three children spend significantly more time using the computer or the internet for personal use on weekdays and weekend days than women with three or more children. Respondents with children spend more time reading than those without children on weekdays and significantly more time reading on weekend days than those without children.

Farm size is significantly negatively associated with time allocated to civic related activities but for weekdays only. On weekend days farm size is positively associated with time allocated to computer or internet use, hobbies and other leisure activities and reading (on weekdays too). On weekdays, seasonal variation has a significant effect on time allocated to watching television, listening to the radio and reading. On weekend days, time allocated to non-paid activities related to farming, phoning and texting friends and family and eating and going out is significantly different across the four seasons. Activities such as using computers or the internet for personal use and hobbies and other leisure activities are allocated more time during the colder and darker months of winter. The distance of the farm household from the nearest village, town or urban centre is significantly positively related to watching television and listening to the radio for both weekdays and weekend days. On weekdays though, respondents living less than 5.8 kilometres from their nearest village or urban centre allocate more time to civic related activities, helping other households informally, leisure

activities such as playing sports, productive exercise, attending sports related activities and using computers or the internet for personal use than those living further from villages and towns. On weekend days, farm household members living greater than or equal to 5.8 kilometres from their nearest urban centre allocate more time to productive exercise, attending sports related activities and using computers and the internet for personal use.

Size of community has a significant effect on time allocated to hobbies and other leisure activities and time allocated to using computers or the internet for personal use, though for men only on weekdays. On weekend days, time allocated to taking breaks from work or study and caring for adults are significantly affected by community size. The allocation of time of farm household members to helping other households informally and attending sports related activities is significantly negatively related to living or farming in ones community for fifty years or more. Rootedness has a significant positive association with time allocated to personal care, resting and sleeping on weekdays and weekend days but a significant negative association with time allocated to childcare on weekdays only. With regard to rootedness, time allocated to religious activities and chatting with family, friends and neighbours is highest amongst farm household members residing or farming in their communities for between fifty and one hundred years compared to those living in their communities for any other length of time.

There are several caveats that apply to the work in this chapter. Much of the discussion is qualitative in nature without rigorous test statistics applied to test the statistical significance of the differences noted. Bivariate analysis, presented in the cross-tabulations, is a preliminary step in understanding the nature of association between a pair of variables. These associations should not be taken as indicating a causal relationship. While two-way tables make the data easy to interpret, they increase the risk of drawing erroneous inferences, because the relationship between two variables may often depend on other variables. A relationship or association evident in a two-way table may be spurious and not evident when other variables are controlled for. Similarly, an apparent absence of association between the cross-tabulated variables does not necessarily mean they are unrelated. Critical variables excluded from the table may be masking a relationship that really does exist. Thus,

multivariate analysis is needed to validate the cross-tabulation results. Nonetheless, cross-tabulations motive future empirical work and provide the basis for future research.

One final caveat associated with the work in this chapter is that the cross-tabulations are presented for key variables and each of the thirty activities. Conducting cross-tabulations of the key variables and more aggregated activity categories, for example the twelve activity groups, may produce statistically significant effects from the same independent variables for the same samples. This is likely because there would be fewer zeros in the aggregated categories and this would lead to much smaller standard errors.

8. Modelling the Determinants of Participation in Civic Engagement and Voluntary Activities

8.1 Introduction

As set out in Chapter 1, one of the primary aims of this thesis is to investigate the level of engagement of farm household members in civic and voluntary activities. Formal voluntary work, through organisations, and informal volunteering, by helping other households, plays an important role in the delivery of socially important goods and services by supplementing the basic services of the welfare state in a functioning civic society. Thus, identifying and understanding the social processes that underpin farm household members' voluntary and civic engagement patterns in rural communities is important for public policy programs that seek to improve the well-being of the rural population and promote rural sustainability. For voluntary and community organisations, a better understanding of who is likely to volunteer, and among volunteers, who is likely to devote substantial amounts of time to this form of unpaid work, is central to improving their ability to develop effective and efficient volunteer management strategies. Within this context, this chapter sets out to examine the factors that influence the participation in, and the number of hours dedicated to, civic engagement and voluntary activities among farm household members in the West of Ireland. The results in this chapter are based on the data from the time use diaries and the individual and household questionnaires in the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey*. The time diary methodology applied in this study provides valuable data for understanding the complexity of civic engagement and voluntary activities of farm household members. For comparative purposes, results from the National Economic and Social Forum (NESF) Survey of Social Capital 2002 (NESF, 2003; Healy, 2005) and the 2006 Survey of Civic Engagement (Taskforce on Active Citizenship, 2007) are also presented.

Civic engagement is action by individuals or collectives designed to identify and address issues of public concern. Civic engagement can take many forms, from individual voluntarism and organizational involvement to electoral participation. It can include efforts to directly address an issue, work with others in a community to solve a problem or interaction

in a range of specific activities or organisations such as trade unions, residence or professional alliances, political parties, parish groups, farm related associations or writing a letter to an elected official or voting. Volunteering is essentially the commitment of time and energy, for the benefit of society, local communities, individuals outside the immediate family, the environment, or other causes. Voluntary activities are undertaken of a person's own free will and are performed without monetary recompense. There are two distinct classes of voluntary activity examined in this chapter, namely formal and informal. Formal volunteering is work carried out by individuals through formally recognised organisations such as Goal or The Simon Community. Informal volunteering refers to a wide range of mutual help and cooperation between individuals within communities without going through an organisation, for example shopping, cleaning or doing farm work for a sick or elderly neighbour, or coaching a local sports team. Almost all previous research has focused on formal volunteering, and thus this research contributes to the existing literature by examining the factors that influence farm household members' participation in informal voluntary activities.

Civic and voluntary activities connect people with each other, build trust and reciprocity through formal and informal associations, and consolidate society through altruism (Alessandrini, 2002). By definition, the act of volunteering is an expression of commitment to one's community and in this way contributes to community development. The benefits of the services provided by volunteers may differ fundamentally from services offered by professionals, because the motivation to serve may be different. In many cases, a unique benefit is derived when the volunteer has more in common with the person being served than a professional might have. This range of activities, services and associations constitutes a crucial source of 'social capital'. Social capital, "consisting of features of social life – networks, norms and trust – that enable participants to act together more effectively to pursue shared objectives" (Putnam, 1995), is increasingly understood as "the basic raw material of civil society" (Onyx and Bullen, 2000:24). It has been identified as a key facet of community development and social inclusion, and a key aspect of the 'capacity' of a community to develop and be sustainable (Gittell and Vidal, 1998; The World Bank, 1999; Onyx and Bullen, 2000; Rothwell and Turcotte, 2006). Governments are interested in social capital because it can potentially encourage and have a positive impact on economic development

(Knack and Keefer, 1997; Brennan and Luloff, 2007), educational achievement (Putnam *et al.*, 1993; Teachman *et al.*, 1996), reduced crime (Halpern, 2001) and better health (Wilkinson, 1991; Department of Community *et al.*, 2000).

Voluntary activity, community development and social support have evolved uniquely in rural Ireland. In response to poverty and other historical conditions in the West of Ireland, tight groupings of families, friends and neighbours formed strong informal social support systems generating a longstanding tradition of voluntary activity and charitable service (Volunteering Ireland, 2010). Such behaviour is consistent with the 'meítheal' tradition, the idea of spirit of community or connectedness within groups of neighbours, throughout Western Ireland (Brennan and Luloff, 2007). This is apparent given the large proportion (16.4%) of the national population (15 years and over) of Ireland who reported that they were involved in one or more voluntary activities at the time of the Census of Population, 2006 (CSO, 2006). Counties Galway, Sligo, Mayo and Roscommon, located in the West, were among the ten counties with the highest proportion of individuals involved in one or more voluntary activity. Additionally 4.8% of all of those that volunteered were farmers, even though farmers make up only 4.4% of the national population, while 18.2% of all farmers in the population volunteered. These statistics suggest that the longstanding tradition of community involvement and voluntary activity is still apparent in the West of Ireland, particularly among farm operators.

Claims that social capital and community engagement have been declining significantly in recent decades have frequently been advanced (Anderson, 1983; Putnam, 2000; Bohan and Shouldice, 2002; GHK, 2010). The harsh economic climate and the declining rural population of the West of Ireland, coupled with the continuing reform of the CAP, have seen agricultural and rural society undergo considerable changes in the past number of years. These have important implications and possibly unfavourable consequences for the level of civic engagement and the quality of life of farm families as farm households are forced to reallocate their time away from farming and free-time activities. At a time when social safety nets are being dismantled and demands on non-profit organisations are growing, an accurate assessment of the causal factors of community and civic engagement is critical. One way to better understand this area is through the study of time use. Time use studies on the

determinants of the participation in civic engagement and voluntary activities by rural households are very limited in number and scope and thus the research in this thesis is an important contribution to the literature.

The rest of the chapter is structured as follows. In Section 8.2, an overview of the empirical literature, from Ireland and internationally, that attempts to explain the motivations for participation in civic and voluntary activities is presented. This is followed in Section 8.3 by a description of the data used in the analysis and the construction of the dependent and predictor variables. Also included in Section 8.3 is a detailed description of the estimation techniques used in the analysis. Section 8.4 presents the relevant summary statistics from the individual and household questionnaires, while Section 8.5 sets out the empirical results of the bivariate analysis, the multivariate logistic regression analysis and the double-hurdle models that are used. Section 8.5 also includes a summary of the results. Finally, Section 8.6 concludes with a discussion of the results and outlines the possible policy implications of the findings.

8.2 Literature

A wide range of studies using labour force data, population surveys, surveys of giving and volunteering and general volunteering surveys have considered the issue of civic engagement and voluntary activity. In such studies the most widely used measurements of the motivation to partake in civic and voluntary activities are annual participation rates and frequencies of participation and not time use diary data. A comprehensive review of this literature reveals that, for the most part, volunteers have characteristics associated with greater demands on their time: the employed, married persons, those with larger families, persons in the 35 to 54 peak earnings ages, the more highly educated and those that are religiously involved. Most strikingly, volunteers have higher wages and family incomes while location relative to an urban centre and rootedness (duration of residence, marital status) are also found to affect the decision to participate in community and/or voluntary activities. The time use methodology applied in this study can generate valuable and complementary information to the currently available literature for understanding the complexity of the decision to partake in such activities.

Looking first at the international literature, education is the most consistent predictor of participation in voluntary activities (McPherson and Rotolo, 1996; Wilson, 2000; Perpek, 2012) and the positive impact of education on voluntary participation has been confirmed in many studies (Smith, 1994). Employing a household production model, Vaillancourt and Payettess (1986; 1994) report probit results on the decision to volunteer and find that, for Canadians at least, the relationship between education and the decision to volunteer is positive. Also using Canadian data, Carr (2001) found similar results using the Heckman two-stage estimator model. Wilson and Musick (1997b) also confirm that education has a positive effect on helping others. Brady *et al.* (1995) and Rosenthal *et al.* (1998) propose that this is because education heightens awareness of problems, increases empathy, and builds self-confidence. On the other hand, Smith (2006) found a very weak correlation between education and volunteerism in the 2002 and 2004 data of the American General Social Survey. Most recently, Van Ingen and Dekker (2011) indicate that the role that education plays in the determination of volunteering has changed and that the differences between the lower and higher educated in their participation in volunteer work have virtually disappeared. This can be explained in part by Brown and Ferris' (2007) finding that the estimated direct impact of education is substantially smaller when social capital is taken into account. They argue that some of the impact in previous studies that empirically examine the effects of education on volunteering is due to correlation between education and omitted social capital variables.

Employment status as a determinant of volunteering has changed over time. Being in employment has the potential to expand people's networks and enhance their skills but also limits their free time. Traditionally, empirical research has rejected the prediction of the strict time allocation model that volunteers are more likely to be those with low opportunity costs of time (Smith, 1994; Wilson and Janoski, 1995; Freeman, 1997; Wilson and Musick, 1997b; Hoge *et al.*, 1998; Putnam, 2000; Eckstein, 2001). In fact, such studies have found that the lowest rates of volunteering are among those not in the labour force at all (unemployed people and homemakers). This suggests that work is a form of social integration, which encourages volunteering. With regard to the relationship between work hours and volunteering, Segal (1993), Smith (1994), Freeman (1997) and Wuthnow (1998) propose that there is a slight upward curve in volunteering as paid hours increase. Most recently though,

Van Ingen and Dekker (2011) report that volunteering is increasingly connected to economically inactive groups, pensioners and homemakers for example.

There is much literature that examines volunteer participation from a perspective that considers time constraints, including market and domestic work, as significant determinants of volunteering (Goss, 1999; Rossi, 2001; Taniguchi, 2012). This literature argues that time allocated to one activity sets an upper limit for the allocation of time to another activity. Time allocated to market work is thus considered a constraint on the participation and the level of participation in voluntary activities (Goss, 1999; Rossi, 2001; Taniguchi, 2006). Despite the constraint argument in explaining the determinants of volunteering, research also suggests that the increased time constraints do not always indicate a lower probability of doing volunteer work, and that time allocated to market work, under certain circumstances, may provide easy access to volunteering services. Freeman (1997) and Wilson and Musick (1997a) find that multiple job holders, usually faced with greater time pressure, are more and not less likely to volunteer. Such counterintuitive patterns are usually considered in the context of resources or social networks that tend to be more available to individuals with stronger labour force attachment.

Rational choice theory would lead one to assume that volunteer participation and hours volunteered would be inversely related to income because opportunity costs rise as incomes rise. Despite this, there is no clear empirical relationship evident in the literature. Smith (1994), Clary and Snyder (1991) and Pearce (1993) find a positive relationship between income and helping others. Brown and Lankford (1992) suggest that the wage rate may not be a critical determinant of volunteering because the choice of work hours is constrained and, because of this, the wage rate may not be equal to the marginal opportunity cost of time. Indeed, Smith (2006) found only a weak correlation between income and volunteerism. On the other hand, using time use diary data, Carlin (2001) finds that rising wages caused a reduced incidence of volunteering for married women but increased the hours of volunteering.

In North America, females are more likely to volunteer than males (Vaillancourt, 1994), but in Europe, the impact of gender is uncertain as females volunteer less than males in some

countries and more than males in others (Hodgkinson and Weitzman, 1996; Gaskin, 1997). As people age, their stock of human capital changes, and so too does the likelihood they will participate in certain activities. Volunteering is found to reach its peak for the 35 to 54 year, peak earnings middle-age group (Schoenberg, 1980; Menchik and Weisbrod, 1987; Brown and Lankford, 1992; Vaillancourt, 1994; Freeman, 1997) as middle aged individuals (25-44) are more likely to be parents of 3 to 5 year old children who benefit the most from the joint production of club-like goods by volunteers. Single women (men) are found to do more (less) volunteer work than their married counterparts (Vaillancourt, 1994). Utilizing micro data from a survey on time use and leisure activities, Nakano (2005) finds that children in the household are both a constraint and an opportunity when it comes to volunteering, depending on the number of children and the children's ages. Employing a two-stage empirical model on U.S. time diary data from the 1970's, Carlin (2001) finds that increases in the number of children in the household significantly raises participation rates of volunteering among married women but reduces volunteer hours. Garcia and Marcuello (2002) estimate a two-stage Heckman model and find that, for women, family size is inversely related to the time dedicated to voluntary activities, but in contrast, for men, family size is positively related the time allocated to voluntary activities.

Residence in communities in smaller towns and villages and rural areas outside major urban centres has been found to have a positive impact on the decision to participate in voluntary activities (Mueller, 1975; Putnam, 2000). It can be argued that this is because in smaller towns and cities, it is less likely that the market will offer many of the goods and services which can be provided by volunteer organisations and also because generally in smaller villages or towns, fewer public goods are provided. A recent study by Taniguchi (2012) argues that social capital variables, such as frequent face-to-face contact with friends, are stronger predictors of volunteerism than demographic or socioeconomic ones. Wilson and Musicks' (1997b) finding that informal social interaction has a positive effect on both formal and informal volunteering is supported by Taniguchi's (2012) results. Other less significant determinants of volunteering and civic activity that have been identified in the literature are rootedness (Smith, 1994), other forms of social engagement and participation such as charitable giving, informal helping, church attendance (Wilson and Janoski, 1995), civic and

political participation, involvement in outdoor sports and recreation (Smith, 1994; Hall *et al.*, 2006) and altruistic attitudes such as a sense of civic duty (Smith, 1994; Freeman, 1997).

There is a significant Irish literature on community and voluntary activity, none of which has used time use survey data however. Ireland has a rich tradition of volunteering in rural communities and a mainstay of rural life is the exchange of labour in agricultural work as farm households provide assistance to friends and neighbours in times of labour shortages (Donoghue, 2001). The principal national data sources on volunteer activity in Ireland in the 1990s arise from surveys of volunteering conducted by the National College of Ireland (NCI) in 1992, 1994 and 1997-98 (Ruddle *et al.*, 1995; 1999). These found a positive association between volunteering rates and educational attainment, socioeconomic status and living in villages (as opposed to towns and cities). They also found that in Ireland the lowest level of volunteering is among those who are unemployed, while the highest percentage of volunteers is evident among those who work outside the home on a part-time basis.

Analysis of data from The National Economic and Social Forum's (NESF) *Survey of Social Capital 2002* by Healey (2005) reaffirmed the findings of the NCI surveys. In particular, other things equal, people who are married, with children and who are settled in a particular geographical location for a long time are more likely to allocate time to volunteering or community activities. It also found that volunteering and community involvement is higher among people in mid-life, between 40 and 64 years of age, that individuals with disabilities and older members of the population are much less likely to be involved in their community, and that level of educational attainment, and by association socio-economic status, are very strongly related to civic engagement measured by volunteering or active community organisation membership. It also emerged that participation by women in the labour force did not appear to be associated with lower levels of volunteering and community involvement, even when other factors such as income and education are controlled for.

More recently, the *2006 Survey of Civic Engagement* report suggested that there is a strong interest in the concept of active citizenship and civic participation in Irish society and a willingness to participate in measures to achieve these (Taskforce on Active Citizenship, 2007, p.17). Using data from a farm household survey conducted in the West of Ireland in

2003, Brick *et al.* (2007) examined the main determinants of the participation of farm couples in community and voluntary activities in rural Ireland. They found that the degree of on-farm diversification and membership of farming organisations (indicators of a commitment to farming in the area) are associated with increased community and social participation. Similar to Brennan and Luloff (2007). They report that the degree of rurality (as measured by distance from the nearest large town) is also an important factor in the community involvement of farm households, as those living in rural areas were more active in the community than their urban counterparts. Brick *et al.* (2007) also found that spouse's education is an important factor in determining the level of community involvement, both of the spouse and the farm operator, and that the presence of children in the household did not significantly affect voluntary work decisions.

8.3 Data and Methods of Analysis

8.3.1 Introduction

This section describes the data, the construction of the variables and the methods used in the analysis of the determinants of participation in and the number of hours dedicated to civic engagement and voluntary activities. The data used in this analysis comes from the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey*. One difficulty with studying civic engagement and voluntary activities is that they are activities that individuals participate in only occasionally. Thus, research based primarily on data collected in time use diaries may not necessarily be the most comprehensive method of examining the determinants of participation in such activities, as there is a danger that this might give rise to under reporting. As discussed in Chapter 4, the collection of data through time use diaries and accompanying individual and household questionnaires offers different and complimentary ways of measuring and analysing the determinants of participation in and the time allocated to civic related and voluntary activities. Therefore, for the purpose of this research, time diary data is considered in conjunction with questionnaire data examining the participation in civic and voluntary activities.

8.3.2 Variables

Table 8-1 presents a detailed description of the construction of the dependent and predictor variables used in the bivariate and multivariate logistic regression analysis. Following the literature review in Section 8.2, a range of potential predictor variables were identified as factors likely to affect the four outcome variables. Other predictor variables are unique to the *Time Use of Farm Household Members in the West of Ireland 2011/12* data. The individual characteristic predictor variables include gender, age, marital status, number of children, level of education, whether the respondent is the main farm operator, whether the respondent has an off-farm job, number of hours worked on the farm and number of hours worked off the farm, self-rated health and self-rated quality of life. Two economic variables were used: employment status and total household income. A number of household and farm composition characteristics including rurality, rootedness, size of community and farm size were used. Finally, because social capital is not directly observable, its presence is inferred in different ways. Thus, social capital variables include social trust, religious activity, informal sociability and living alone.

While the predictor variables have been discussed in Section 4.3.1, two variables worth noting are the level of trust variable and the informal sociability variable. The level of trust variable is a measure of the general level of trust that the respondent has in society. It is generated by constructing an index from the answers to two questions. The first question asks respondents if in their area most people can be trusted or if in their area they can never be too careful. They can also respond that they don‘t know. The answers are scored with a zero for ‘don’t know’, a one for ‘can never be too careful’ and a two for ‘most people can be trusted’. Asked if they felt the area in which they live is a safe place, respondents’ answers were given a score of zero if they answered no and a score of one if they answered yes. Aggregated, scores on this index range between zero, which reflects a complete lack of trust and faith in others and three, which shows that respondent’s feel that people can be trusted and the area in which they live is safe. This index is transformed into a binary variable equalling zero for those with a low level of trust or scoring zero, one or two on the trust index and one for respondents with a high level of trust or scoring three on the trust index. The binary variable

is created because there are only a few respondents who score zero, two or three on the trust index.

The informal sociability variable is constructed from two questions in the individual questionnaire. These questions ask respondents if they had visited anyone in their home or had anyone visit them in their home in the four weeks prior to completing the survey. A binary variable was constructed from the answers to these two questions. Respondents who paid a social visit, had someone visit them or neither visited nor had anyone visit them are considered to have low levels of sociability and thus scored a zero. Respondents who visited someone else in their home and who had someone visit them are considered to have high levels of informal sociability and thus scored a one. The size of community variable was dichotomised (community of greater than or equal to 500 people or less than 500 people) because of the small numbers in these categories. Self-rated health and quality of life were also transformed into binary variables equalling one if respondents reported fair, poor or very poor health or quality of life and zero if respondents reported good or very good health or quality of life.

Table 8-1 Description of Dependent Variables and Covariates

	Covariates	Description
Dependent Variables	Regular Volunteering	Binary variable indicating voluntary activity on a regular basis. Voluntary activity was measured by asking reapondents "If they take part in any type of unpaid voluntary activity outside of their own home on a regular basis".
	Actively Involved in the Community (Ref: 12 Months)	Binary variable indicating voluntary activity in the last 12 months. Voluntary activity was measured by asking reapondents "If they had been actively involved in any type of voluntary or community group in the last twelve months".
	Part of a Project to Organise a New Service in the Community	Binary variable indicating whether the respondent has ever been part of a project to organise a new service in their area. If the respondent answered yes to this question, it means that at one time they may have been socially engaged in their community but the respondent may be no longer able to participate in community activities.
	Civically Engaged (Ref: 12 Months)	Binary variable indicating civic engagement. Civic engagement was measured by asking reapondents if, in the last twelve moneths, they had partaken in any of seven activities listed e.g. joining an action group or contacting a public representative. Civic engagement was then measured as participation in at least one of the seven activities.
Individual Characteristics	Gender	Binary variable, 0 = Male, 1 = Female.
	Age	A categorical variable with three bands indicating whether the respondent falls into age category (1) 19-40 yrs, (2) 41-60 yrs, or (3) 61+ yrs category.
	Marital Status	Binary variable indicating whether the respondent is married or has a partner (1) or is single, separated or widowed (0).
	Number of Children	Number of Children.
	Level of Education	Categorical variable with five bands indicating the highest level of education the respondent has completed. (1) Primary, (2) Junior Certificate, (3) Leaving Certificate (or equivalent), (4) Post-Leaving Certificate/Other, (5) Third Level.
	Farm Operator	Binary variable indicating whether the respondent is the main farm operator (1) or not (0).
	Off-Farm Job	Binary variable indicating whether the respondent works off the farm (1) or not (0).
	Off-Farm Job (hrs worked)	Categorical variable identifying all of those doing zero hours of off-farm work (0), between 1hrs & 31 hrs of off-farm work (1) and greater than 31 hrs of off-farm work (2).
	Farm Work (hrs worked per wk)	Categorical variable identifying the number of hours of farm work per week: (1) between 0 & 8hrs (2) between 9hrs & 17hrs (3) between 18hrs & 26hrs (4) between 27hrs & 35hrs (5) Greater than 36 hrs per week.
	Self-Rated Health	A self-rated measure of general health, originally measured on a five point scale (very good, good, fair, poor and very poor). This was transformed into a binary variable equalling (1) if respondents reported fair, poor or very poor health and (0) otherwise.
	Self-Rated Quality of Life	A self-rated measure of quality of life, originally measured on a five point scale (very good, good, fair, poor and very poor). This was transformed into a binary variable equalling (1) if respondents reported fair, poor or very poor quality of life and (0) otherwise.
Economic Variables	Employment Status	A categorical variable with five bands describing the respondent's situation regarding employment: (1) Employed (not farming), (2) Self-employed (inc. full-time farming), (3) Employed & part-time farming, (4) Retired, (5) Unemployed, Homemaker or Student.
	Total Household Income	A categorical variable with five bands. Includes total household gross income from all sources.
Household & Farm Characteristics	Rurality	Distance to nearest village, town or urban centre in kilometers.
	Rootedness	A categorical variable with five bands indicating the length of time the family has been living/farming in the area or community. (1) 1-10 years (2) 11-20 years (3) 21-50 years (4) 51-100 years (5) Over 100 years.
	Size of Community	Binary variable indicating whether the respondent is living in a community/village of 500 people or less (0) or a village or town of greater than 500 people (1).
	Farm Size	Farm size in hectares.
Social Capital Indicators	Trust Index	Binary variable (0) Low level of trust (1) High level of trust.
	Religious Activity	A binary variable that indicates if the respondent reported doing any religious activity (1) in either the weekday or weekend day diary.
	Living Alone	A binary variable that indicates if the respondent is living alone where (1) represents living alone and (0) otherwise.
	Informal sociability	Binary variable (0) Low level of informal sociability (1) High level of informal sociability.

8.3.3 Bivariate Analysis

At a basic level, the data extracted from the individual questionnaire can be used to analyse the determinants of participation in civic and voluntary activities. Four questions relating to the participation in civic and voluntary activities were included in the individual questionnaire. The first asked respondents if they take part in any type of unpaid voluntary activity or service outside of their own home or work place on a regular basis (volunteers regularly). The second asked respondents if they were actively involved in any type of voluntary or community group in the twelve months prior to completing the survey (active involvement in the community). An additional way of recording voluntary activity is to ask respondents if they have ever been part of a project to organise a new service in their area (ever volunteered). This question helps to identify if an individual was at any time socially engaged, as it may be the case that an individual was extremely pro-active in the community in the past, though at the time of the survey may be incapacitated or housebound and no longer able to participate in community activities. Finally, civic engagement was measured by asking people the extent to which they are involved in a variety of political and local community actions (civic engagement). For the purpose of this research, participation in at least one of seven possible areas of activity within the previous 12 months constituted civic engagement.

There is a wide range of study factors, many of which are highly correlated, that can affect the likelihood of volunteering regularly, being actively involved in the community, being part of a project to organise a new service or being civically engaged. This means that there are often different ways of explaining their effects. The assessment of their effects depends on whether the study factors are examined one at a time (simple relationships) or simultaneously (complex relationships). In line with this, bivariate analysis is used to evaluate the simple relationships between the four dependent variables and a range of potential individual, economic, social capital, household and farm predictor variables. The statistical tests appropriate for the nature of the data were used (i.e. chi-squared test and Fisher's exact test). Because significance tests are performed simultaneously on the same group of individuals, the tests are not independent, thus, the issue of the appropriate level of significance for repeated tests on the same sample is raised. Theory holds that at a given significance level

(α) the true Type I error rate (rejecting the null hypothesis) for n separate but non-independent tests is n · α (Holm, 1979; Cabin and Mitchell, 2000; Fox, 2008). For example, for individual tests of 19 parameters (n) in a model using a critical p value (α) of 0.05 for each test, where all parameters are actually zero in the population, there is a $19 \cdot 0.05 = 0.95$ chance of obtaining false-positive results (type I errors). In other words, there is a 95% chance of deciding that one or more parameters in the model are different from zero, when in fact they are equal to zero. For exploratory research based on model generation procedures, this is a real possibility.

A solution is to adjust the α level by making a standard Bonferroni correction to account for the large number of tests. The Bonferroni correction is made by dividing the critical p value (α) by the number of tests (n) being performed. In the example given here, the α level for each of the 19 tests then becomes 0.0026. Thus, for any given test, the null hypothesis that a particular parameter is zero will be rejected only when the probability that it is zero is less than 26 out of a thousand. This puts severe limitations on testing the components of the model as only the strongest effects would prove to be significantly different from zero under these conditions, particularly as the number of tests becomes large. In response to this limitation, the strategy for model generation adopted in this section uses critical p values (α) of * 0.1, ** 0.05 and *** 0.01. Without adjustment to test for inter-dependence, the models generated in this analysis require further testing on independent data in order to validate the findings. Results from the bivariate analysis between the study variables are presented in Section 8.5.

8.3.4 Multivariate Logistic Regression Analysis

Multivariate logistic regression analysis is used to identify the factors which are associated with volunteering regularly, being actively involved in the community, being part of a project to organise a new service and being civically engaged[28]. As such, there are likely to be important determinants of the decision to participate in any of these four dependent variables.

[28] Seemingly unrelated regression (SUR) analysis was considered however it was discounted because each equation contains exactly the same set of regressors.

Given four binary variables Y that are coded 1 for volunteering regularly, being actively involved in the community, being part of a project to organise a new service or being civically engaged and 0 for not, the mean of Y is the proportion of the sample who participate. In this sample, 42% of farm household members volunteer regularly, so the probability of volunteering regularly, π, is 0.42. It is possible to estimate a linear model that predicts the probability of volunteering regularly using ordinary least squares (OLS) regression, though there are problems with this approach. The assumptions necessary for using least squares are violated and the fundamental form of the linear model is not appropriate for predicting probabilities (Long, 1997). Thus, multivariate logistic regression techniques that express the probability of civic engagement and volunteering as the odds of civic engagement and volunteering are used in this chapter. Results from the logistic regression analysis are presented in Section 8.5.

8.3.5 Double-Hurdle Model

In this sub-section, the methods used for analysing the data extracted from the time use diaries are described. The dependent variables in this section are those relating to the time allocated to civic activities and informally helping other households. The first, civic activities, reports the total minutes allocated to formal voluntary or organisational work, dealing with the police, political, community or trade union meetings, organising sports, coaching, completing surveys, providing means, scouts, youth clubs, etc. The second category, informal help to other households, comprises construction and repairs as help, help in farming and other unspecified informal help to other households. To represent all the minutes allocated to civic activities and volunteering in a single summary variable, a third variable (volunteering) is defined as the sum of the minutes spent in civic activities and informally helping other households.

As discussed in Section 3.5, there are several challenges that arise when modelling daily time use decisions. The large number of zero responses in time use data is a common problem for data analysts. There are two sources of zero observations that reflect the respondents' behaviour and the nature of the data collection method: there are individuals that never participate in a particular activity and there are individuals who usually participate but for

some reason did not participate on the selected diary day. A second challenge in the analysis of time use data is the choice of econometric model that accounts for the sequential and possibly interrelated decisions faced by individuals. The most frequently applied approaches for modelling the prevalence of zero observations and the decision problems described above are the standard Tobit (Type I) model (Tobin, 1958), sample selection models such as Heckman's two-stage estimator model (Heckman, 1974; 1976; 1979; Dubin and Rivers, 1989) or double-hurdle models, also known as two-part models (Cragg, 1971; Duan *et al.*, 1983), each of which are specified in Section 3.5. The choice of the most appropriate approach is highly case specific and depends largely on the activity under consideration, the assumptions about the origin of daily nonparticipation and the specific objectives of the study.

Following Dow and Norton (2003), Madden (2006) indicates that the choice between available approaches rests on three criteria: theoretical, practical and statistical. Theoretical criteria relate to the detailed objectives of the study such as whether the focus is on modelling potential or actual outcomes. Madden (2006) surmises that, if the focus of the study is on the marginal effects of covariates on actual participation, as opposed to potential participation, the double-hurdle model is more appropriate than Heckman's (1976; 1979) sample selection model. Practical criteria pertain to model specification, characteristics of sample design and other practical details, such as the existence of exclusion restrictions required by Heckman's two-stage estimator model. In the case of the sample selection model, in order to separately identify the decision regarding participation from the level of participation decision, it is necessary to have variables which enter the participation equation but do not enter the level of participation equation. Akin to Sartori (2003), Madden (2006) pointed out that if these variables, known as exclusion restrictions, cannot be found then separate identification depends upon the non-linearity of the extra term, known as the inverse Mills ratio (IMR), which appears in the level of participation equation. The issue is that the IMR is frequently an approximately linear function over a wide range of its argument and so estimates from the level of participation equation in the sample selection model may be non-robust owing to collinearity issues. Finally, statistical criteria consist of available statistical tests which would enable one to discriminate between the two models.

In this study, the following case specific criteria are used for selecting the appropriate multivariate analysis method:

1. The primary interest of this chapter is to investigate factors affecting the actual daily behaviour, not potential or latent behaviour.
2. A respondent participates in an activity (d = 1) if, and only if, an observed time spent on a voluntary activity during a diary day is greater than zero (y > 0), otherwise, a respondent is a nonparticipant (d = 0).
3. The primary objective is to identify the factors affecting both the participation and time use decisions.

Given the criteria outlined, the most straightforward approach to model sequential participation and time use decisions is a double-hurdle model such as Cragg's (1971) or Duan *et al.* (1983). Khandker (1988), Brick *et al.* (2007), Madden (2006) and more recently Vaara and Matero (2011) reject the standard Tobit (Type I) model and Heckman's two-stage estimator model in favour of Cragg's (1971) model. The fundamental assumption of the Cragg and Duan models, as applied in this case, is that the parameters of the determinants of the participation decision and the level of participation decision are not restricted to be the same for both decisions. For example, being married may affect the participation decision in one way (increasing the likelihood of participation) and may affect the hours decision another way (reducing the number of hours). The first part of the double-hurdle model consists of a probit model predicting the likelihood of non-zero time use by an individual (participation). The second part of the model is a continuous regression model (OLS), applied only to the subsample with participants, to estimate the amount of time spent on voluntary activities (time use). Finally, an OLS model was used on all 376 observations and the differences in results between the double-hurdle and the straight OLS models are discussed.

Before running the double-hurdle model, frequencies and means were computed to obtain descriptive information on the sample. Cross-tabulations and the various and appropriate tests of significance were used to check for the existence of relationships between variables. Significance values are reported at $p<0.1$, $p<0.05$ and $p<0.01$. As discussed in Section 3.5, time use data consists of both continuous and discrete (exact zeros) values, is non-negative, generally right skewed and distributions of time data contain many zeros. Because of the

exact zeros (and often because the data is highly positively skewed), the normality assumption is violated. For this reason the non-parametric Mann-Whitney *U* test is preferable to the independent samples t-test and the Kruskal-Wallis test is preferable to one-way independent-measures Analysis of Variance (ANOVA). Presented in Table 8-2 is a detailed description of the construction of the dependent variables and the additional predictor variables used in the cross-tabulations and the double-hurdle models. The additional predictor variables are related to the time use diary section of the questionnaire. For the purpose of the double-hurdle model, the variable age is dichotomised (19 to 60 years of age and 61 plus years of age) because of the small numbers in each of the age categories.

Table 8-2 Description of Dependent Variables and Additional Covariates for the Double-Hurdle Model

	Covariates	Description
Dependent Variables	Daily Participation - Civic Engagement/Formal Volunteering	Dummy = 1, if observed time spent doing organised voluntary/organisational work, organising sports/coaching, etc. during diary day > 0, otherwise = 0.
	Daily Participation - Informal Help to Other Households	Dummy = 1, if observed time spent informally helping other households during diary day> 0, otherwise = 0.
	Daily Participation - Voluntary Activity (Civic Engagement/Formal Volunteering or Informal Help to Other Households)	Dummy = 1, if observed time spent civically engaged, doing formal volunteering or informally helping other households during diary day> 0, otherwise = 0.
	Daily Time Spent by Participants - Civic Engagement/Formal Volunteering	Observed time spent doing organised voluntary/organisational work, organising sports/coaching, etc. during diary day, min/day, when participating dummy = 1.
	Daily Time Spent by Participants - Informal Help to Other Households	Observed time spent informally helping other households during diary day, min/day, when participating dummy = 1.
	Daily Time Spent by Participants - Voluntary Activity (Civic Engagement/Formal Volunteering or Informal Help to Other Households)	Observed time spent civically engaged, doing formal volunteering or informally helping other households during diary day, min/day, when participating dummy = 1.
Other Variables	Season	Categorical variable indicating the season in which the diary was filled out: (1) Winter, (2) Spring, (3) Summer, or (4) Autumn.
	Weekday	Binary variable indicating whether the diary was completed on a weekday (0) or a weekend day (1)

8.4 Summary Statistics

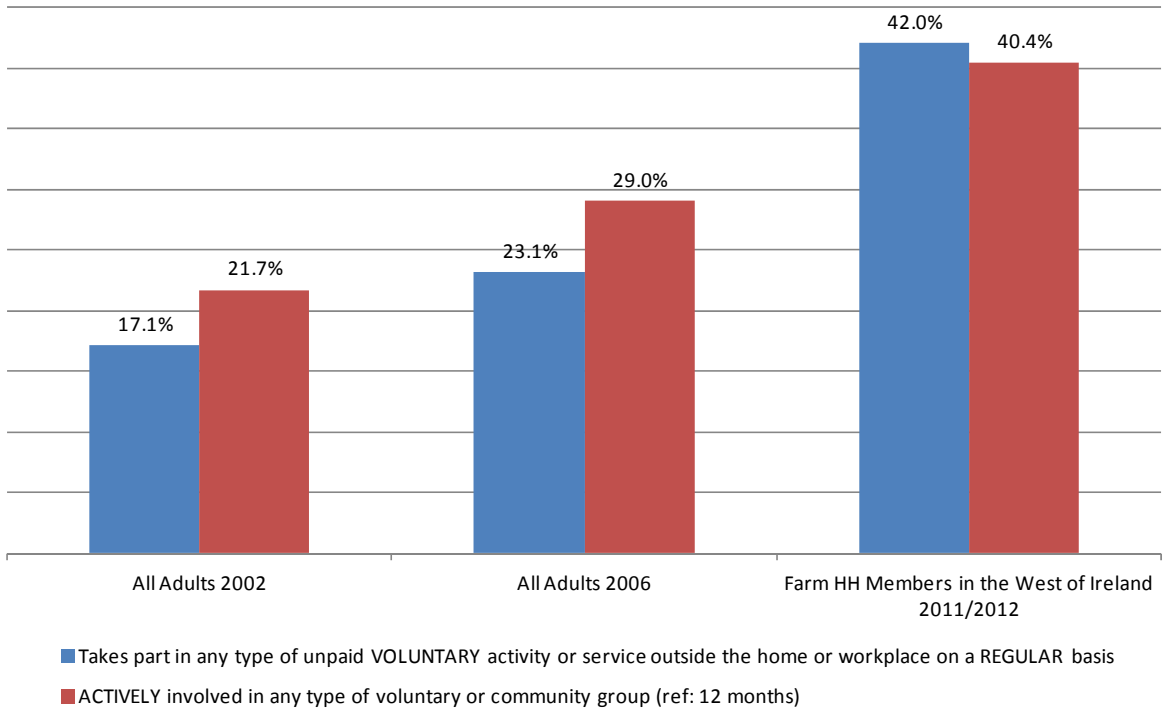
This section presents summary statistics relating to the participation in, and the number of hours dedicated to civic engagement and voluntary activities among farm household members in the West of Ireland. It starts by presenting summary statistics from the data relating to civic engagement and volunteering extracted from the individual questionnaires. For comparative purposes, results from the NESF Survey of Social Capital 2002 (NESF, 2003; Healy, 2005) and the *2006 Survey of Civic Engagement* (Taskforce on Active Citizenship, 2007) are also presented. The 2002 and 2006 data relates to a representative

sample of the adult population of Ireland while the 2011/12 data relates to farm household members in the West of Ireland only. It should be noted that the wording of the questions in cross comparisons were identical in all surveys.

8.4.1 Volunteering and Active Community Engagement

The following is a comparison of regular voluntary activity and active voluntary or community engagement across the national population in 2002 (NESF, 2003), 2006 (Taskforce on Active Citizenship, 2007) and farm household members in the West of Ireland in 2011/12. The results of the 2002, 2006 and 2011/12 surveys are analysed across gender marital status, level of education and employment status. Data on age, total household income, farm operator and off-farm employment are available for 2011/12 only. Figure 8-1 suggests that there has been an increase in regular volunteering and active community engagement in the decade since the first survey was commissioned. These increases in regular volunteering and active community engagement apply across the board for most groups. Regular volunteering increased from 17% of the adult population in 2002 to 23% in 2006, while in 2011/12 42% of farm household members volunteered (NESF, 2003; Taskforce on Active Citizenship, 2007). Active voluntary or community engagement increased from 22% of the adult population in 2002 to 29% in 2006 and increased again to 42% for farm household members in 2011/12 (NESF, 2003; Taskforce on Active Citizenship, 2007). There was a 6 to 7% increase in regular volunteering and active community engagement between the years 2002 and 2006 suggesting an upward trend in regular volunteering and active community engagement across the general population. If the increase in regular volunteering and active community engagement continued at the same rate, this would imply that 29% of the general population would be volunteering regularly and just over 36% would be actively engaged in their communities in 2012. This would compare to 42% of farm household members who volunteer regularly and over 40% who are actively engaged in their communities in 2011/12. Thus, it seems likely that a higher proportion of farm household members from the West of Ireland are engaged in their communities and involved in voluntary activities than adults from the general population.

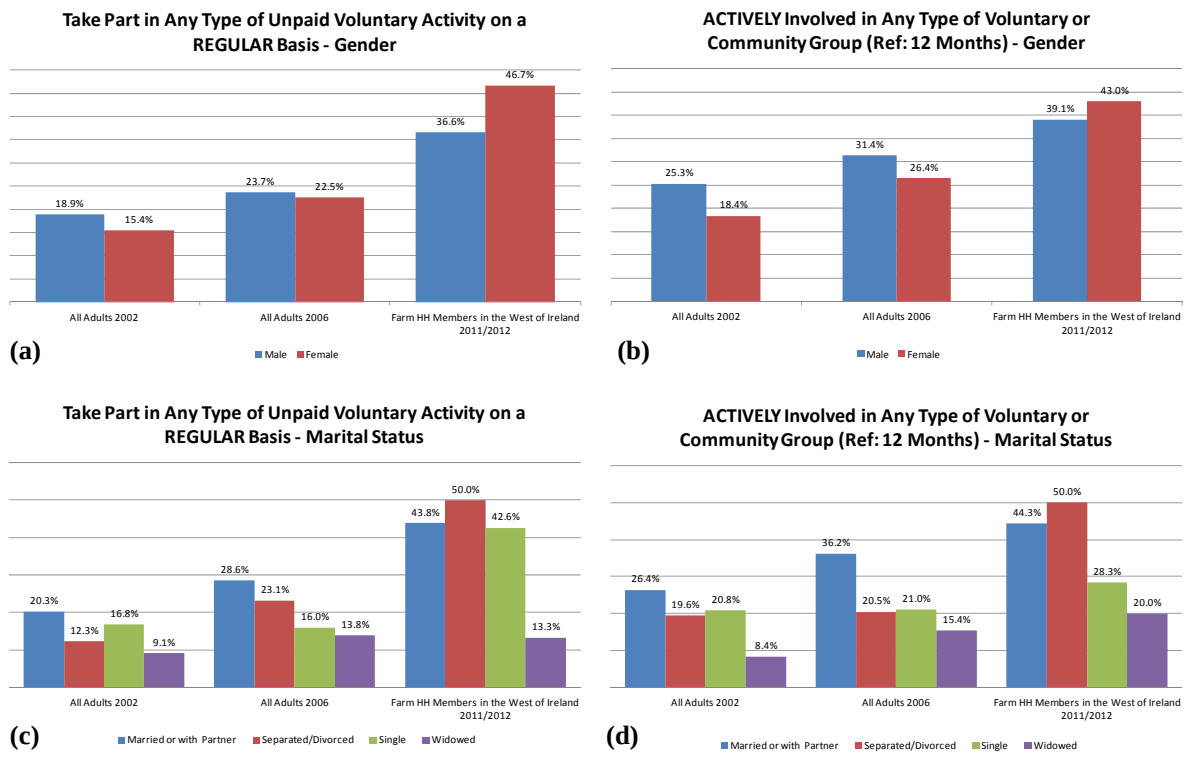
Figure 8-1 Voluntary Activity by All Respondents



Data Source: NESF (2003); Taskforce on Active Citizenship (2007); Time Use of Farm Household Members in the West of Ireland 2011/2012 Survey (2012)

Unlike the adult population in 2002 and 2006 where higher proportions of men volunteer regularly and are actively involved in their communities, Figure 8-2 shows that in 2011/12, regular volunteering and active engagement in the community is highest among female farm household members compared to their male counterparts. Across the three datasets, the lowest proportions of respondents that volunteer regularly and actively engage in their communities are those who are widowed. In 2002 and 2006, respondents who were married or had a partner were the most likely to volunteer regularly and engage in their communities on a regular basis. With regard to farm household members in 2011/12, those who are separated or divorced are most likely to volunteer regularly or actively participate in their communities (Figure 8-2).

Figure 8-2 Voluntary Activity by Gender and Marital Status

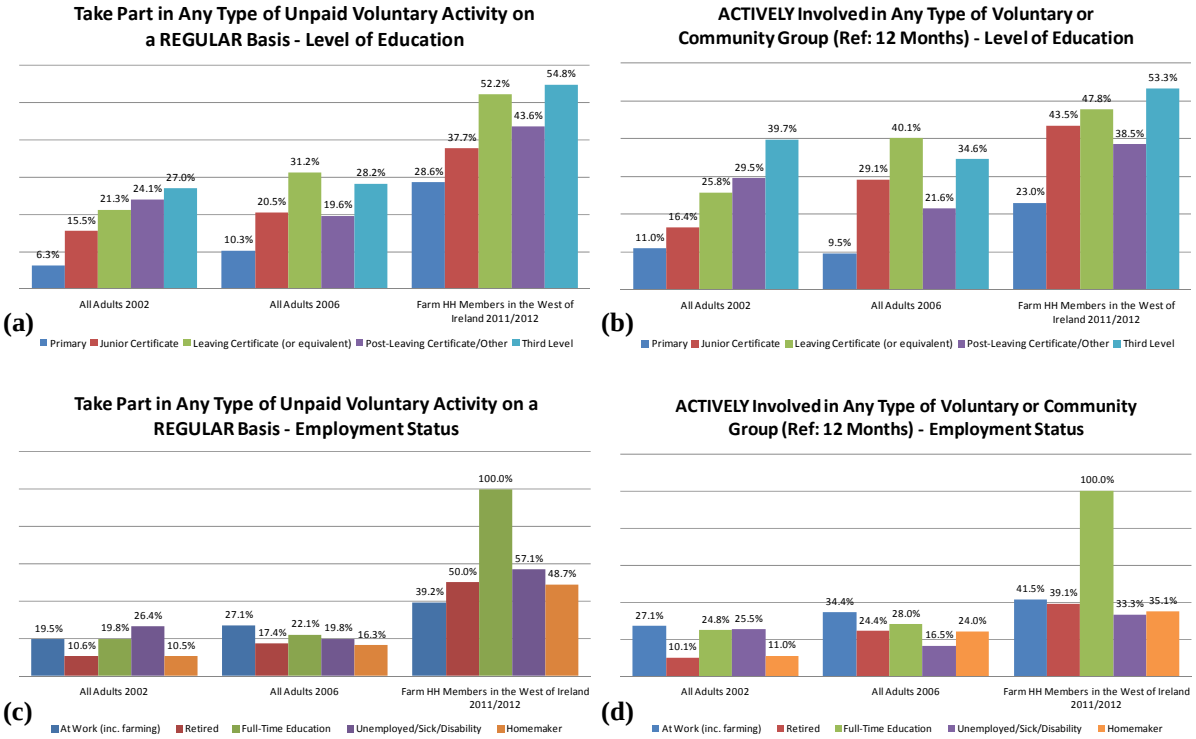


Data Source: NESF (2003); Taskforce on Active Citizenship (2007); Time Use of Farm Household Members in the West of Ireland 2011/2012 Survey (2012)

In 2002 a higher proportion of respondents with a third level education volunteered regularly and were actively engaged in their communities compared to those with any other level of education, though in 2006 volunteering and community engagement was highest among respondents with a leaving certificate qualification. In contrast to the adult population in 2006, regular volunteering and engagement in the community is highest among farm household members with a third level education and lowest among those whose highest level of education was the completion of primary school (Figure 8-3). A higher proportion of farm household members who are unemployed, sick or have a disability volunteer regularly than those who are employed, retired or looking after the home or family. Conversely, farm household members who are employed, including farmers, are more likely to be actively engaged in their communities than any other group. Though all farm household members who are in full-time education volunteer regularly and engage in their communities, there is only one respondent engaged in full-time education. Thus, this figure is not representative of

the sample as a whole. Overall, these results suggest greater community engagement and volunteering among higher socio-economic groups.

Figure 8-3 Voluntary Activity by Level of Education and Employment Status

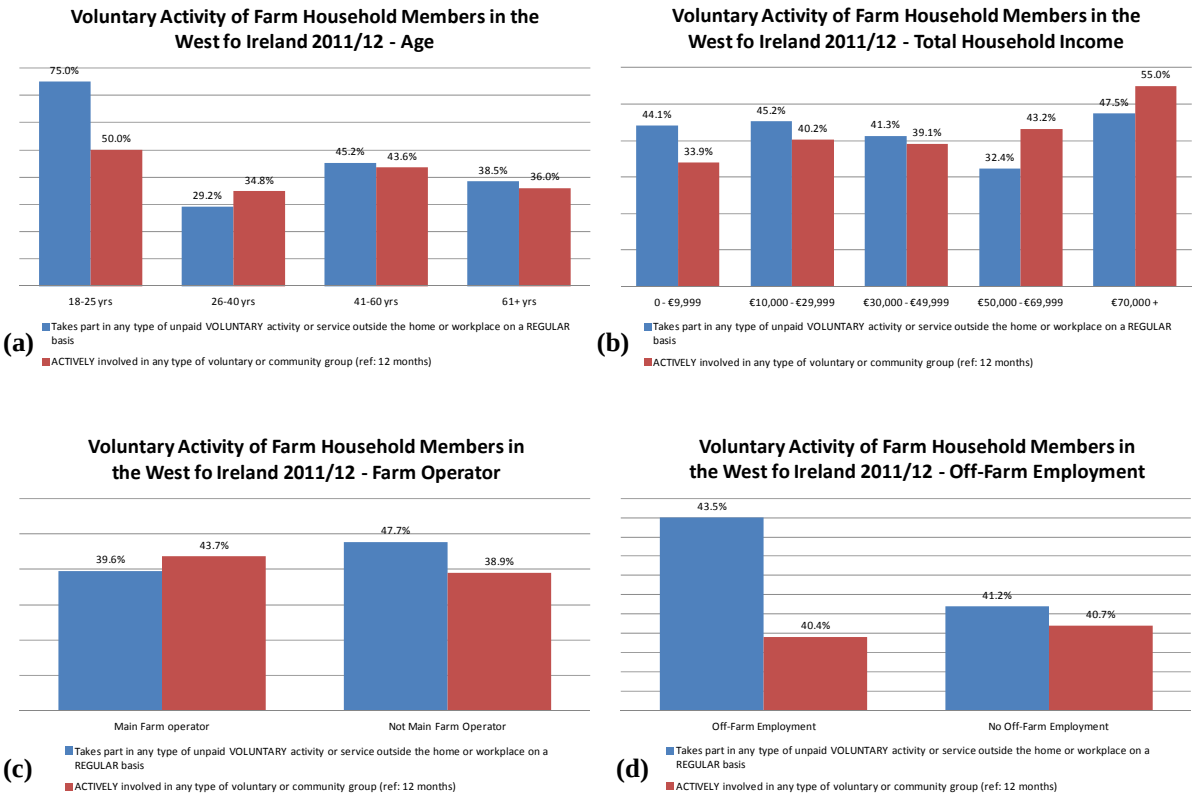


Data Source: NESF (2003); Taskforce on Active Citizenship (2007); Time Use of Farm Household Members in the West of Ireland 2011/2012 Survey (2012)

Higher proportions of farm household members in the 18-25 years of age category volunteer regularly and are actively engaged in their communities than in any other age category (Figure 8-4). The lowest level of regular volunteering and active community engagement is among 26 to 40 year olds. Figure 8-4 illustrates that there is very little variation in the proportion of farm household members volunteering regularly across total household income, though there is a slight positive relationship between total household income and active community engagement. A higher proportion of farm household members who are not the main farm operator volunteer regularly compared to farm operators, though the opposite is true for community engagement with a higher proportion of farm operators engaged in their community in the twelve months prior to the survey (Figure 8-4). Two percent more farm household members who are working off the farm volunteer regularly than those who do not

work off the farm. With regard to community engagement, there is very little difference in participation rates between those who work off the farm and those who do not work off the farm (Figure 8-4).

Figure 8-4 Voluntary Activity by Age, Total Household Income, Farm Operator and Off-Farm Employment



Data Source: NESF (2003); Taskforce on Active Citizenship (2007); Time Use of Farm Household Members in the West of Ireland 2011/2012 Survey (2012)

Respondents in the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey* were asked to record if they had ever been part of a project to organise a new service in their area. This question helps to identify if an individual was at any time socially engaged, as it may be the case that an individual was pro-active in their community in the past, but at the time of the survey the respondent may be incapacitated or housebound and no longer able to participate in community activities. 28% of farm household members reported being part of a project or committee to organise a new service in their area at some point in time.

8.4.2 Civic Engagement

Civic engagement was examined by asking respondents the extent to which they are involved in a variety of political and local community actions. This involves critical awareness, action with others or on one's own as well as more sustained political involvement through active membership of an organisation. The taskforce on active citizenship refer loosely to these areas of engagement as 'civic-political engagement' (Taskforce on Active Citizenship, 2007). Table 8-3 presents the comparisons across the data from the NESF's Survey of Social Capital 2002 (NESF, 2003; Healy, 2005), the 2006 Survey of Civic Engagement (Taskforce on Active Citizenship, 2007) and the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey*.

Civic-political engagement, measured as participation in at least one of seven possible areas of activity within the previous 12 months increased from 30.8% for all adults in 2002 to 37.2% in 2006. There is a considerable increase to 78.1% for farm household members in 2011/12. This can be interpreted in two ways. There may be an overall increase in the civic-political engagement of all adults or farm household members may be more civically engaged than the general population. However, disregarding either interpretation, only a minority of farm household members do not engage in at least one type of civic-political engagement. A higher proportion of farm household members attended public meetings, joined action groups and contacted public representatives in 2011/12 than all adults in the population in 2006. There is a substantial increase, from 2.8% to 10.3%, in the proportion of farm household members that volunteered to work for a political party in 2011/2012. However, this is most likely due to the general election held in 2011. Whereas 55% of farm household members made a voluntary donation of money to charities, schools or churches, less then 10% of them joined an action group, wrote to a newspaper or contacted or appeared on radio or TV.

Table 8-3 Percentage of Adults & Farm Household Members who Engaged in Various Types of Civic Political Behaviour

	All Adults 2002	All Adults 2006	Farm HH Members in the West of Ireland 2011/2012
At least one type of engagement	**30.8%**	**37.2%**	**78.1%**
Attended a Public Meeting	17.5%	18.8%	45.1%
Joined an Action Group	5.5%	4.5%	6.6%
Written to a Newspaper	3.5%	3.6%	2.9%
Contacted/appeared on Radio/TV	4.5%	4.6%	2.9%
Voluntary Work for a Political Party	3.1%	2.8%	10.3%
Contacted a Public Representative	14.4%	15.3%	18.3%
Made a voluntary donation of money	63.3%		55.3%

8.5 Results

The first part of the empirical analysis in Section 8.5.1 involves bivariate analysis, presented in the cross-tabulations. The estimates of the structural models of the likelihood of civic engagement and volunteering using multivariate logistic regression analysis are presented in Section 8.5.2. The dependent variables are derived from a series of questions relating to civic engagement and volunteering in the individual questionnaire. In the next part of the analysis in Section 8.5.3, a double-hurdle model consisting of a probit regression and an ordinary least squares regression estimating the determinants of the participation in and the allocation of time to civic related and voluntary activities is presented. Section 8.5.4 presents the results of OLS regressions estimating the determinants of the allocation of time to civic related and voluntary activities and discusses the differences in the results between the double-hurdle model and the OLS regression. Finally, a summary of the results of participation in civic engagement and voluntary activities from the individual questionnaires and the time use diaries are presented in Section 8.4.5.

8.5.1 Bivariate Analysis

Before undertaking the multivariate analysis, cross-tabulations, chi-squared and Fisher's exact tests were used to evaluate the relationship between the four dependent variables and a

range of potential socio-demographic, social capital, household and farm predictor variables. The exact significance levels are reported at $p<0.1$, $p<0.05$ and $p<0.01$. A series of multivariate logistic regression models were then undertaken to examine the relationship between regularly volunteering, being actively involved in the community, being part of a project to organise a new service or being civically engaged and individual, household and farm characteristics and a number of indicators of social capital.

Descriptive statistics for variables used in the estimation are presented in Table 8-4. At the bivariate level, education and informal sociability were found to be associated with regular volunteering. In particular farm household members with higher levels of education and informal sociability are significantly more likely to report that they volunteer on a regular basis. Being actively engaged in voluntary or community groups in the twelve months prior to completing the survey is associated with educational attainment, marital status, living alone, informal sociability and self rated health. Farm household members with higher levels of education and informal sociability are significantly more likely to report that they are actively involved in voluntary or community groups. Those who are married, those who are not living alone and those reporting good health are also more likely to report being actively involved in the community. Health affects voluntary activities because poor health has a limiting effect on the individual's ability to participate and on the amount of time they can contribute (Gallagher, 1994; Wilson and Musick, 1997b). Marital status and health were found to be associated with having ever been part of a group or a project to organise a new service in the community. The variables associated with civic engagement, income and employment status are different from those associated with participation in voluntary activities. Farm household members living in households with higher incomes are significantly more likely to be civically engaged than those residing in households with lower incomes. Consistent with the literature, respondents who are employed and not farming, self-employed or employed and part-time farming are more likely to participate in civic related activities than those who are retired, unemployed, homemakers or students. It is worth noting that some of the samples in the bivariate analysis are small and this could potentially explain why there is no statistically significant relationship between the dependent variables and some of the predictor variables.

Table 8-4 Percentage Reporting Participation in Regular Volunteering, Active Community Engagement, Ever Volunteering and Civic Engagement

	% Reporting That They Volunteer on a Regular Basis (n)		% Reporting that They were Actively in any Type of Voluntary or Community Group in the Last 12 Months (n)		% Reporting that They had Been Part of a Project to Organise a New Service at Some Point (n)		% Reporting that They were Engaged in a Civic Related Activity in the Last 12 Months (n)	
All	42.0 (115)		40.4 (110)		27.8 (76)		78.1 (214)	
Total Income								
0-€9,999	44.1 (26)	ns	33.9 (20)	ns	23.3 (14)	ns	66.7 (40)	**
€10,000-€29,999	45.2 (38)	ns	40.2 (33)	ns	30.1 (25)	ns	78.6 (66)	**
€30,000-€49,999	41.3 (19)	ns	39.1 (18)	ns	26.1 (12)	ns	78.3 (34)	**
€50,000-€69,999	32.4 (12)	ns	43.2 (16)	ns	27.0 (10)	ns	86.5 (32)	**
> €70,000	47.5 (19)	ns	55.0 (22)	ns	38.5 (15)	ns	90.0 (36)	**
p	0.686		0.329		0.567		0.044	
Education:								
Primary or Less	28.6 (18)	**	23.0 (14)	**	23.8 (15)	ns	73.0 (46)	ns
Group/Inter/Junior Cert	37.7 (26)	**	43.5 (30)	**	33.3 (23)	ns	81.2 (54)	ns
Leaving Cert	52.2 (35)	**	47.8 (32)	**	25.8 (17)	ns	82.1 (55)	ns
Post Leaving Cert/Diploma	43.6 (17)	**	38.5 (15)	**	25.6 (10)	ns	74.4 (29)	ns
Third Level Degree or Higher	54.8 (17)	**	53.3 (16)	**	35.5 (11)	ns	83.9 (26)	ns
p	0.037		0.020		0.624		0.658	
Employment Status:								
Employed (not farming)	51.4 (18)	ns	38.9 (14)	ns	27.8 (10)	ns	77.8 (28)	**
Self-employed (inc. full-time farmers)	35.1 (39)	ns	46.0 (46)	ns	27.9 (31)	ns	81.8 (90)	**
Employed & Part-Time Farming	39.7 (23)	ns	43.1 (25)	ns	28.1 (16)	ns	86.2 (50)	**
Retired	50.0 (12)	ns	39.1 (9)	ns	37.5 (9)	ns	70.8 (17)	**
Unemployed/Homemaker/Student	21.1 (23)	ns	36.4 (16)	ns	22.7 (10)	ns	62.2 (28)	**
p	0.222		0.966		0.794		0.033	
Age:								
19-40 yrs	35.7 (10)	ns	58.8 (10)	ns	14.3 (4)	ns	75.0 (21)	ns
41-60 yrs	45.2 (70)	ns	43.6 (68)	ns	29.5 (45)	ns	81.3 (126)	ns
61+ yrs	38.5 (35)	ns	36.0 (32)	ns	29.7 (27)	ns	75.8 (67)	ns
p	0.459		0.469		0.239		0.342	
Gender								
Male	39.6 (72)	ns	39.1 (70)	ns	25.0 (45)	ns	77.4 (140)	ns
Female	46.7 (43)	ns	43.0 (40)	ns	33.3 (31)	ns	79.6 (74)	ns
p	0.255		0.534		0.145		0.674	
Marital Status:								
Separated/ Single/Widowed	37.1 (26)	ns	30.0 (20)	**	18.6 (13)	**	75.4 (52)	ns
Married/Partner	43.8 (89)	ns	44.3 (90)	**	31.2 (63)	**	78.9 (161)	ns
p	0.328		0.025		0.043		0.537	
Children								
No	43.8 (32)	ns	37.0 (27)	ns	20.6 (15)	ns	76.7 (56)	ns
Yes	41.5 (83)	ns	41.7 (83)	ns	30.7 (61)	ns	78.5 (157)	ns
p	0.729		0.482		0.100		0.752	
Main Farm Operator								
No	47.7 (41)	ns	43.7 (38)	ns	31.0 (27)	ns	77.0 (67)	ns
Yes	39.6 (74)	ns	38.9 (72)	ns	26.5 (49)	ns	78.5 (146)	ns
p	0.208		0.456		0.436		0.783	
Off-Farm Job								
No	41.5 (68)	ns	40.7 (66)	ns	30.7 (50)	ns	75.5 (123)	ns
Yes	43.1 (47)	ns	40.4 (44)	ns	23.9 (26)	ns	90.0 (90)	ns
p	0.786		0.951		0.219		0.213	
Off-Farm Job (hrs worked per wk)								
0 hours	43.4 (56)	ns	42.5 (54)	ns	32.8 (42)	ns	75.8 (97)	ns
Between 1 and 31 hrs	47.7 (21)	ns	46.5 (20)	ns	22.7 (10)	ns	72.7 (32)	ns
Greater then 1 hrs	37.6 (38)	ns	35.3 (36)	ns	23.8 (24)	ns	83.3 (85)	ns
p	0.474		0.366		0.225		0.249	

Farmwork (hrs worked per wk)												
0-8hrs	39.3	(24)	ns	33.3	(20)	ns	27.9	(17)	ns	75.4	(46)	ns
9-17hrs	44.4	(16)	ns	55.6	(20)	ns	24.3	(9)	ns	64.9	(24)	ns
18-26hrs	48.6	(17)	ns	31.4	(11)	ns	29.4	(10)	ns	85.7	(30)	ns
27-35hrs	34.8	(16)	ns	34.8	(16)	ns	32.6	(15)	ns	84.8	(39)	ns
> 36hrs	43.5	(40)	ns	44.6	(41)	ns	26.4	(24)	ns	78.0	(71)	ns
p	0.745			0.130			0.926			0.174		
Trust Index												
Low	37.7	(32)	ns	32.9	(28)	ns	28.2	(24)	ns	73.8	(62)	ns
High	43.5	(80)	ns	42.9	(78)	ns	27.7	(51)	ns	79.5	(147)	ns
p	0.367			0.123			0.930			0.302		
Religious Activity												
No	37.7	(52)	ns	39.7	(54)	ns	26.5	(36)	ns	75.2	(103)	ns
Yes	46.3	(63)	ns	41.2	(56)	ns	29.2	(40)	ns	81.0	(111)	ns
p	0.147			0.805			0.615			0.243		
Living Alone												
No	43.0	(102)	ns	43.0	(101)	**	29.2	(69)	ns	77.7	(185)	ns
Yes	36.1	(13)	ns	25.0	(9)	**	19.4	(7)	ns	80.0	(28)	ns
p	0.433			0.041			0.223			0.762		
Living in the Community												
1 – 10 years	14.3	(1)	ns	14.3	(1)	ns	14.3	(1)	ns	85.7	(6)	ns
11 – 20 years	14.3	(1)	ns	42.9	(3)	ns	71.4	(5)	ns	85.7	(6)	ns
21 – 50 years	54.6	(18)	ns	51.5	(17)	ns	21.2	(7)	ns	87.9	(29)	ns
51 – 100 years	39.0	(32)	ns	35.8	(29)	ns	30.9	(25)	ns	72.3	(60)	ns
100 + years	44.1	(143)	ns	42.3	(60)	ns	26.6	(38)	ns	78.2	(111)	ns
p	0.148			0.342			0.102			0.452		
Size of Community												
Village < 500 people	42.9	(39)	ns	42.9	(39)	ns	25.0	(23)	ns	77.2	(71)	ns
Village or Town of 500 people or more	41.5	(76)	ns	39.2	(71)	ns	29.3	(53)	ns	78.6	(143)	ns
p	0.834			0.565			0.456			0.792		
Informal Sociability												
Low	34.4	(56)	***	33.8	(54)	**	25.9	(42)	ns	77.3	(126)	ns
High	53.3	(57)	***	49.1	(53)	**	30.8	(33)	ns	78.5	(84)	ns
p	0.002			0.012			0.379			0.816		
Self-Rated Health												
Good	43.5	(94)	ns	44.0	(95)	**	30.6	(67)	*	78.4	(171)	ns
Poor	37.0	(20)	ns	25.0	(13)	**	17.7	(9)	*	76.9	(40)	ns
p	0.388			0.012			0.064			0.812		
Self-Rated Quality of Life												
Good	43.1	(94)	ns	42.8	(92)	ns	30.1	(65)	ns	79.2	(171)	ns
Poor	36.5	(19)	ns	32.1	(17)	ns	20.8	(11)	ns	75.9	(41)	ns
p	0.387			0.155			0.176			0.604		

Asterisks indicate levels of significance: * p<0.1, **p<0.05, and *** p<0.01

Presented in Table 8-5 are the results of the cross-tabulations, chi-squared and Fisher's exact tests that were used to evaluate the relationship between the participation in and the time allocated to civic related activities, informal volunteering, volunteering in general (measured by participation in either civic related activities or informal voluntary work) and a variety of individual, economic, household and farm characteristics as well as indicators of social capital. It is important for the interpretation of these results to note that that participation in civic related activities includes formal volunteering.

The daily participation rate in civic related activities is 7.5%, implying that farm household members engage in civic related activities on 27 days of the year. Over 8% of respondents participated in informal voluntary work. This equates to informal volunteering such as helping other households with construction or repairs or with farming activities being done on 31 days of the year. Overall, just over 15% of farm household members partake in some form of voluntary activity, implying that the average annual number of participation days is 55 days. In other words, on 55 days of the year, farm household members allocate some time to unpaid work for the benefit of others or their communities. The average daily time that farm household members (those who participate) spend doing civic related activities is 10 minutes. The average time spent helping other households informally is 7 minutes per day. Altogether, farm household members who participate in voluntary activities allocate an average of 17 minute to such activities. It is interesting to note that if farm household members engage in voluntary activity on 55 days of the year and spend an average of 17 minute volunteering on each of those days, over the course of a year they allocate 15 hours and 35 minutes to voluntary. This is just over two standard working days in Ireland.

The bivariate analysis in Table 8-5 shows an association between participation in civic related activities, employment status, hours worked on the farm per week, level of trust and informal sociability. More specifically, the analysis shows that farm household members who are employed and part-time farming are more likely to participate in civic related activities. Respondents who allocate between 18 and 26 hours to farmwork per week are significantly more likely to participate in civic related activities and those with high levels of trust and reporting higher levels of informal sociability are significantly more likely to participate in civic related activities. Level of income and education, employment status, age, off-farm job, hours worked on the farm per week, level of trust, religiosity, rootedness, quality of life and day of the week are associated with participation in informal voluntary activities. Religiosity is the only factor that is found, at the bivariate level, to affect the time allocated to informal voluntary activity. Interestingly, time use diary analysis shows that people who do not participate in religious activities are significantly more likely to help other households informally and allocate significantly more time to helping other households informally. With regard to volunteering in general, level of income and education, employment status, age,

hours worked on the farm per week, rootedness, informal sociability and day of the week are associated with the decision to participate.

Table 8-5 Daily Participation Rates and Average Time Allocated to Civic Related Activities, Informal Volunteering and Volunteering in General

	CivicActivities				Informal Voluntary Work				Volunteering (Civic engagement or informal volunteering)			
	Daily Participation Rate (% /day)		Daily Time Spent Participants (mn/day)		Daily Participation Rate (% /day)		Daily Time Spent Participants (mn/day)		Daily Participation Rate (% /day)		Daily Time Spent Participants (mn/day)	
All	7.5	(39)	9.9		8.5	(44)	7.2		15.2	(79)	17.1	
Total Income												
0-€9,999	10.5	ns	155.5	ns	**9.5**	*	82.5	ns	**18.1**	**	133.4	ns
€10,000-€29,999	8.1	ns	148.8	ns	**13.1**	*	88.6	ns	**20.6**	**	115.0	ns
€30,000-€49,999	4.4	ns	86.3	ns	**7.8**	*	75.0	ns	**11.1**	**	87.0	ns
€50,000-€69,999	5.4	ns	120.0	ns	**5.4**	*	90.0	ns	**10.8**	**	105.0	ns
> €70,000	7.7	ns	97.5	ns	**2.6**	*	90.0	ns	**11.4**	**	95.6	ns
p	0.539		0.770		**0.065**		0.990		**0.042**		0.908	
Education:												
Primary or Less	7.6	ns	126.7	ns	**13.4**	***	85.3	ns	**19.3**	**	108.9	ns
Group/Inter/Junior Cert	4.5	ns	92.5	ns	**5.3**	***	68.6	ns	**9.0**	**	86.3	ns
Leaving Cert	9.6	ns	166.3	ns	**13.6**	***	85.6	ns	**22.4**	**	123.2	ns
Post Leaving Cert/Diploma	9.3	ns	147.9	ns	**1.3**	***	30.0	ns	**10.7**	**	133.1	ns
Third Level Degree or Higher	6.5	ns	101.3	ns	**4.8**	***	140.0	ns	**11.3**	**	117.9	ns
p	0.558		0.780		**0.004**		0.389		**0.014**		0.701	
Employment Status:												
Employed (not farming)	**2.9**	***	105.0	ns	**2.9**	**	97.5	ns	**5.7**	**	101.3	ns
Self-employed (inc. full-time farmers)	**4.2**	***	125.0	ns	**10.3**	**	83.2	ns	**14.0**	**	98.5	ns
Employed & Part-Time Farming	**16.4**	***	120.8	ns	**5.5**	**	120.0	ns	**21.8**	**	120.6	ns
Retired	**10.9**	***	150.0	ns	**17.4**	**	86.3	ns	**23.9**	**	130.9	ns
Unemployed/Homemaker/Student	**6.3**	***	180.0	ns	**7.5**	**	52.5	ns	**12.5**	**	121.5	ns
p	0.001		0.450		**0.043**		0.181		**0.014**		0.720	
Age:												
19-40 yrs	**0.0**	**	0.0	ns	**1.8**	**	240.0	ns	**1.8**	***	240.0	ns
41-60 yrs	**9.1**	**	135.6	ns	**7.1**	**	83.6	ns	**16.2**	***	112.8	ns
61+ yrs	**7.1**	**	125.0	ns	**13.1**	**	79.8	ns	**17.9**	***	108.5	ns
p	0.030		0.714		**0.014**		0.220		**0.003**		0.324	
Gender												
Male	8.2	ns	133.4	ns	9.6	ns	85.0	ns	16.9	ns	112.8	ns
Female	6.2	ns	129.5	ns	6.2	ns	85.9	ns	11.9	ns	112.9	ns
p	0.424		0.975		0.186		0.711		0.129		0.964	
Marital Status:												
Separated/ Single/Widowed	7.6	ns	156.0	ns	6.1	ns	103.1	ns	13.0	ns	140.3	ns
Married/Partner	7.5	ns	124.1	ns	9.3	ns	81.3	ns	12.9	ns	105.2	ns
p	0.946		0.628		0.263		0.131		0.414		0.285	
Children												
No	7.6	ns	108.0	ns	7.6	ns	93.0	ns	15.2	ns	100.5	ns
Yes	7.5	ns	140.7	ns	8.8	ns	82.9	ns	15.2	ns	116.9	ns
p	0.969		0.357		0.672		0.371		0.988		0.563	
Main Farm Operator												
No	6.1	ns	157.5	ns	7.9	ns	87.7	ns	12.7	ns	129.3	ns
Yes	8.2	ns	123.6	ns	8.7	ns	84.2	ns	16.3	ns	106.8	ns
p	0.396		0.165		0.745		0.990		0.286		0.428	
Off-Farm Job												
No	6.9	ns	142.9	ns	**11.4**	***	81.9	ns	17.0	ns	112.8	ns
Yes	8.5	ns	120.0	ns	**4.2**	***	98.3	ns	12.7	ns	112.8	ns
p	0.490		0.219		**0.004**		0.426		0.185		0.913	
Off-Farm Job (hrs worked per wk)												
0 hours	7.1	ns	152.6	ns	10.9	ns	78.6	ns	16.8	ns	116.6	ns
Between 1 and 31 hrs	10.3	ns	116.7	ns	6.9	ns	105.0	ns	17.2	ns	112.0	ns
Greater than 31 hrs	6.7	ns	116.5	ns	6.2	ns	87.5	ns	12.3	ns	106.9	ns
p	0.534		0.345		0.176		0.823		0.363		0.854	
Farmwork (hrs worked per wk)												
0-8hrs	**2.7**	**	220.0	ns	**2.7**	**	50.0	ns	**5.3**	**	135.0	ns
9-17hrs	**13.2**	**	136.7	ns	**5.9**	**	131.3	ns	**17.6**	**	146.3	ns
18-26hrs	**15.2**	**	150.0	ns	**9.1**	**	85.0	ns	**22.7**	**	134.0	ns
27-35hrs	**6.6**	**	122.5	ns	**8.8**	**	76.9	ns	**15.4**	**	96.4	ns
> 36hrs	**3.1**	**	94.1	ns	**12.8**	**	84.8	ns	**17.8**	**	93.3	ns
p	**0.010**		0.147		**0.033**		0.380		**0.013**		0.299	

Trust Index												
Low	**4.4**	*	126.4	ns	**11.9**	*	79.7	ns	15.6	ns	96.0	ns
High	**8.4**	*	134.5	ns	**6.7**	*	91.9	ns	14.3	ns	122.4	ns
p	**0.099**		0.669		**0.051**		0.479		0.700		0.344	
Religious Activity												
No	6.8	ns	127.2	ns	**9.8**	*	**90.4**	*	15.7	ns	110.9	ns
Yes	9.3	ns	141.4	ns	**5.3**	*	**61.9**	*	13.9	ns	117.9	ns
p	0.327		0.872		**0.097**		**0.074**		0.602		0.738	
Living Alone												
No	7.3	ns	120.9	ns	8.9	ns	84.0	ns	15.3	ns	106.5	ns
Yes	9.0	ns	195.0	ns	6.0	ns	97.5	ns	14.9	ns	156.0	ns
p	0.635		0.132		0.300		0.576		0.937		0.103	
Living in the Community												
1 – 10 years	0.0	ns	0.0	ns	**7.7**	***	30.0	ns	**7.69**	**	30.0	ns
11 – 20 years	0.0	ns	0.0	ns	**0.0**	***	0.0	ns	**0**	**	0.0	ns
21 – 50 years	9.1	ns	130.0	ns	**21.2**	***	94.3	ns	**28.79**	**	110.5	ns
51 – 100 years	7.5	ns	156.8	ns	**4.1**	***	66.7	ns	**13.0**	**	122.4	ns
100 + years	7.9	ns	120.7	ns	**7.2**	***	90.0	ns	**14.4**	**	111.4	ns
p	0.647		0.434		**0.008**		0.338		**0.018**		0.434	
Size of Community												
Village < 500 people	9.2	ns	118.1	ns	8.0	ns	73.9	ns	16.1	ns	104.5	ns
Village or Town of 500 people or more	6.6	ns	142.2	ns	8.7	ns	90.5	ns	14.7	ns	117.4	ns
p	0.298		0.875		0.809		0.414		0.685		0.632	
Informal Sociability												
Low	**5.6**	*	124.4	ns	7.2	ns	91.4	ns	**12.4**	*	108.6	ns
High	**9.5**	*	140.3	ns	10.0	ns	81.4	ns	**18.1**	*	118.8	ns
p	**0.086**		0.691		0.256		0.554		**0.074**		0.996	
Self-Rated Health												
Good	7.3	ns	130.2	ns	7.5	ns	88.1	ns	14.4	ns	112.4	ns
Poor	8.4	ns	140.6	ns	12.6	ns	77.5	ns	18.9	ns	114.2	ns
p	0.706		0.303		0.106		0.479		0.259		0.473	
Self-Rated Quality of Life												
Good	7.4	ns	128.7	ns	**7.1**	**	86.5	ns	14.0	ns	111.6	ns
Poor	8.2	ns	146.3	ns	**14.4**	**	82.5	ns	20.6	ns	116.3	ns
p	0.766		0.124		**0.020**		0.990		0.103		0.216	
Rushed												
No	6.7	ns	144.0	ns	8.5	ns	80.9	ns	14.6	ns	113.8	ns
Yes	12.2	ns	93.3	ns	8.1	ns	112.5	ns	18.9	ns	108.2	ns
p	0.100		0.235		0.906		0.488		0.335		0.766	
Season												
Winter	7.1	ns	105.0	ns	7.9	ns	67.5	ns	14.3	ns	90.0	ns
Spring	5.9	ns	145.0	ns	9.9	ns	105.0	ns	14.9	ns	128.0	ns
Summer	9.3	ns	150.0	ns	7.6	ns	98.3	ns	16.9	ns	126.8	ns
Autumn	7.4	ns	130.4	ns	8.6	ns	76.0	ns	14.9	ns	109.0	ns
p	0.815		0.577		0.935		0.283		0.943		0.359	
Weekend												
No	7.7	ns	114.0	ns	**12.3**	***	92.8	ns	**19.2**	**	105.0	ns
Yes	7.3	ns	151.6	ns	**4.6**	***	65.0	ns	**11.2**	**	126.2	ns
p	0.887		0.481		**0.002**		0.115		**0.011**		0.755	

Asterisks indicate levels of significance: * p<0.1, **p<0.05, and *** p<0.01

8.5.2 Multivariate Logistic Regression Model

Presented in Table 8-6 are the estimates of the multivariate logistic regression models of the relationship between regular volunteering, active community engagement, civic engagement and participation in an organisation to organise new service in the community and a range of individual, economic, household and farm characteristics as well as indicators of social

capital[29]. Predictive variables are selected according to earlier studies and variables identified as significant in the bivariate analyses were also included in the logistic regression models. Linktests were used to detect specification errors and the overall goodness-of-fit of each model was assessed by means of likelihood ratio chi-squared (χ^2), Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC) and McFadden's R-squared test statistics. All statistical tests were two tailed and 95% confidence intervals are reported for all odds ratios. The sections that follow present a discussion of the predictor variables that were found to have a statistically significant effect on regular volunteering, active community engagement, civic engagement and participation in an organisation to organise a new service in the community. It is important to note that many of the sub-samples in Table 8-6 are small and thus, findings that have substantive economic or practical relevance may not be statistically significant.

Level of education emerges as a predictor of regular volunteering. The results show that farm household members with higher levels of education are significantly more likely to volunteer on a regular basis. These results are similar to those found by Healy (2005) across the general population of Ireland. Healy (2005) reports that higher education graduates were seven times more likely to volunteer regularly than those whose education was completed before Intermediate or Junior Certificate level. Farm household members who are employed and part time farming are significantly less likely to volunteer regularly than those who are employed and not farming. This is most likely because farm household members who are employed and farming are time constrained and substitute between work and volunteering on a regular basis.

There is a significant positive association between age and regular volunteering. Respondents who are over forty years of age are significantly more likely to volunteer on a regular basis. The finding for age corroborates Healy's (2005) finding that volunteering and community involvement is higher among people in mid-life, between 40 and 64 years of age and Van Ingen and Dekker (2011) who reported that respondents aged 55 to 69 years had the strongest inclination to volunteer. Also consistent with the literature, being married or having a partner

[29] Seemingly unrelated regression (SUR) models were considered however each equation contains the same set of predictor variables and thus, multivariate logistic regression analysis was deemed the most appropriate method of analysis.

is significantly positively associated with regular volunteering. Carr (2001) suggests that married individuals often have more time available to them because household chores are shared between the two individuals and that by being married, an individual is more likely to have knowledge of volunteering opportunities directly through their spouse, or indirectly through contacts their spouse may have. Consistent with previous studies by Wilson and Musick (1997b) and Taniguchi (2012), the logistic regression analysis reveals that informal sociability (measured as receiving or paying a social visit) is significant and positively associated with regular volunteering. It can be argued that farm household members who are embedded in a web of social relations and those who have frequent interaction with friends, have access to resources which help them build dense social networks, thus increasing their likelihood of volunteering. Respondents allocating between 18 and 35 hours to farm work per week are significantly more likely to volunteer on a regular basis than those allocating less than 8 hours to farm work. It is likely that farm household members allocating between 18 and 35 hours to farming are full-time farmers who are more embedded in their communities and thus allocate more time to activities within their communities.

Education is a strong predictor of active community engagement. Farm household members with higher levels of education are significantly more likely to be actively engaged in their communities than those with primary education or less. Using data from the UK National Child Development Study, Schuller *et al.* (2001) report higher levels of social skills for higher levels of education. Social skills include organising, advising and counselling skills, all of which have the potential to enhance the quality of community engagement. Respondents who are retired are significantly more likely to be actively engaged in their communities when compared to those who are employed and not farming. Being married or having a partner is significantly positively associated with active community engagement. Respondents reporting high levels of informal sociability are also significantly more likely to be actively engaged in their communities. Self-rated health and living alone are invariant with respect to regular volunteering, once other factors are statistically controlled for. In the case of health, the statistically significant and positive association between self-rated health and regular volunteering in the bivariate analysis in Table 8-4 is not statistically significant once other variables are entered into the multivariate analysis.

The logistic regression analysis also reveals that respondents with a household income of between €10,000 and €29,999 are significantly more likely to have been part of an organisation or project to organise a new service in their community than those with an income of less than €10,000. Household income is a direct indicator of the wealth of an individual and represents the opportunity costs that individuals face when making decisions about the allocation of their time. However, greater wealth may also facilitate greater volunteer participation. Table 8-6 also reveals that being married or having a partner is significantly and positively associated with a respondent having been part of a project to organise a new service in their community. It is thought that being married is linked to the presence of children in the house. Organising a new project or service may have the advantage of benefitting other family members including children, thus the rationale for married individuals participating in such activities. Hours of farm work are negatively associated with organising a new service in an area when other variables are controlled for. Farm household members who work greater than 31 hours in an off-farm job are significantly less likely to have been part of a project to organise a new service in their community. It is likely that working off the farm, while fulfilling on-farm obligations, has a limiting effect on the individual's ability to allocate time to other activities, volunteering being one of them.

With regard to civic engagement, only two variables are found to be statistically significantly associated with participation in civic related activities in one's community, namely distance from nearest village or town and farm size. The further from a village or town that the respondent resides, the less likely they are to participate in civic related activities. On the other hand, there is a positive association between farm size and civic engagement. That is to say, the larger the farm size, the more likely the respondent is to participate in civic related activities.

Table 8-6 Multivariate Logistic Regression of Regular Volunteering, Active Community Engagement, Participation in a New Service and Civic Engagement (Odds Ratios)

Independent Variable	Volunteer Regularly		Active Community Engagement		Part of a Project to Organise a New Service in the Community		Civic Engagement	
	Odds Ratio (95% CI)		Odds Ratio (95% CI)		Odds Ratio (95% CI)		Odds Ratio (95% CI)	
Total Income Ref: 0 - €9,999								
€10,000-€29,999	1.43	(0.46-4.44)	2.46	(0.77-7.86)	3.30 *	(0.93-11.76)	2.44	(0.66-9.04)
€30,000-€49,999	1.01	(0.26-3.90)	3.02	(0.77-11.82)	2.31	(0.54-9.87)	1.33	(0.28-6.32)
€50,000-€69,999	0.38	(0.08-1.90)	1.17	(0.27-5.17)	0.96	(0.20-4.72)	0.84	(0.16-4.53)
> €70,000	1.46	(0.36-5.92)	2.44	(0.61-9.81)	3.04	(0.64-14.47)	3.91	(0.55-27.62)
Education Ref: Primary or Less								
Group/Inter/Junior Cert	2.27	(0.69-7.43)	2.60	(0.80-8.44)	1.33	(0.41-4.29)	1.22	(0.36-4.16)
Leaving Cert	3.46 *	(0.96-12.45)	3.29 *	(0.95-11.40)	0.56	(0.15-2.15)	2.34	(0.56-9.73)
Post Leaving Cert/Diploma	5.51 **	(1.33-22.79)	5.37 **	(1.28-22.52)	1.70	(0.40-7.28)	1.57	(0.33-7.44)
Third Level Degree or Higher	3.72	(0.58-23.85)	5.23 *	(0.89-30.73)	0.10 *	(0.01-1.05)	1.76	(0.14-22.57)
Employment Status Ref: Employed (not farming)								
Self-employed (inc. full-time farmers)	0.59	0.10-3.33)	1.95	(0.39-9.70)	0.57	(0.08-4.02)	2.52	(0.30-21.29)
Employed & Part-Time Farming	0.15 **	(0.03-0.76)	1.90	(0.44-8.15)	2.43	(0.43-13.71)	4.17	(0.56-31.26)
Retired	3.60	(0.43-30.36)	6.34 *	(0.78-51.87)	5.39	(0.49-59.20)	3.56	(0.32-39.43)
Unemployed/Homemaker/Student	1.15	(0.21-6.26)	1.33	(0.26-6.75)	0.19	(0.02-1.50)	0.75	(0.11-5.16)
Age Ref: 19-40 yrs								
41-60 yrs	8.74 **	(1.29-58.99)	2.70	(0.52-14.14)	8.78	(0.37-207.97)	1.42	(0.19-10.65)
61+ yrs	8.29 **	(1.01-68.47)	3.07	(0.48-19.78)	8.12	(0.29-228.77)	1.19	(0.12-11.64)
Marital Status Ref: Separated/Single/Widowed								
Married/Partner	8.31 **	(1.42-48.80)	5.06 *	(0.88-29.14)	23.22 ***	(2.95-182.52)	1.33	(0.23-7.84)
Number of Children	0.88	(0.70-1.11)	0.96	(0.77-1.19)	1.09	(0.86-1.38)	1.00	(0.78-1.28)
Religious Activity Ref: No								
Yes	1.08	(0.49-2.40)	0.64	(0.29-1.39)	0.63	(0.27-1.47)	1.15	(0.46-2.92)
Living in the Community Ref: 1-10 years								
11 – 20 years	0.10	(0.00-5.38)	2.26	(0.06-86.67)	9.63	(0.10-912.73)	0.52	(0.00-86.76)
21 – 50 years	1.50	(0.07-30.15)	7.01	(0.32-152.19)	0.19	(0.01-7.45)	2.44	(0.07-80.93)
51 – 100 years	0.61	(0.03-12.67)	2.86	(0.13-62.60)	0.27	(0.01-9.59)	1.14	(0.04-34.30)
100 + years	0.54	(0.03-11.32)	3.03	(0.14-66.11)	0.29	(0.01-10.59)	1.30	(0.04-39.42)
Size of Community Ref: Village < 500 people								
Village or Town of 500 people or more	0.65	(0.27-1.58)	0.85	(0.36-1.98)	1.25	(0.47-3.32)	1.03	(0.34-3.07)
Distance from nearest Village or Town (km)	0.94	(0.84-1.04)	0.92	(0.83-1.02)	0.95	(0.85-1.07)	0.88 **	(0.79-0.99)
Gender Ref: Male								
Female	0.57	(.167-1.96)	0.70	(0.21-2.31)	1.20	(0.32-4.48)	2.40	(0.50-11.48)
Informal Sociability Ref: Low								
High	1.98 *	(0.91-4.32)	1.99 *	(0.91-4.36)	1.12	(0.49-2.57)	1.14	(0.45-2.88)
Off-Farm Job Ref: No								
Yes	2.58	(0.43-15.47)	0.84	(0.16-4.44)	0.34	(0.04-3.03)	2.45	(0.28-21.12)
Off-Farm Job (hrs worked per wk) Ref: 0 hours								
Between 1 and 31 hrs	0.98	(0.19-5.12)	2.07	(0.42-10.21)	0.25	(0.04-1.55)	0.31	(0.04-2.25)
Greater than 31 hrs	0.54	(0.15-1.93)	0.78	(0.23-2.65)	0.28 *	(0.07-1.11)	1.17	(0.30-4.53)
Hours Worked on the Farm Per Wk Ref: Between 0 & 8hrs								
Between 9 & 17hrs	2.18	(0.53-8.94)	2.83	(0.71-11.27)	1.12	(0.22-5.59)	0.88	(0.19-4.14)
Between 18 & 26hrs	5.04 *	(0.99-25.59)	1.36	(0.29-6.36)	1.05	(0.20-5.47)	3.13	(0.42-23.41)
Between 27 & 35hrs	3.82 *	(0.79-18.58)	1.45	(0.33-6.46)	1.49	(0.31-7.20)	1.95	(0.34-11.30)
Greater than 36hrs	2.20	(0.49-10.00)	1.46	(0.34-6.30)	0.37	(0.08-1.81)	1.31	(0.25-6.93)
Trust Index Ref: Low								
High	1.44	(0.62-3.32)	1.34	(0.58-3.11)	0.67	(0.28-1.63)	1.09	(0.43-2.76)
Self-Rated Health: Good								
Poor	0.80	(0.24-2.59)	0.48	(0.16-1.46)	0.43	(0.12-1.49)	1.39	(0.43-4.51)
Self-Rated Quality of Life: Good								
Poor	0.69	(0.12-2.21)	1.15	(0.38-3.50)	0.44	(0.12-1.64)	0.96	(0.28-3.32)
Size of Farm (ha)	1.01	(0.99-1.02)	1.01	(0.99-1.02)	1.01	(1.00-1.03)	1.03 **	(1.00-1.05)
Living Alone Ref: No								
Yes	-	-	1.16	(0.08-16.63)	-	-	1.73	(0.10-28.72)
Constant	0.01 **		0.00 ***		0.03		0.13	
Observations	192		191		191		192	
Model Pseudo R-squared	0.2341		0.1956		0.2354		0.1985	
Log Liklihood	-99.611		-104.18928		-89.658964		-80.843	
Linktest	ns		ns		ns		ns	
lstat	71.35%		72.25%		79.58%		81.77%	
lroc	0.8126		0.7863		0.8037		0.7903	

Asterisks indicate levels of significance: * p<0.1, **p<0.05, and *** p<0.01

8.5.3 Double-Hurdle Models

As indicated in Section 5.3.2, all respondents kept diaries for two 24-hour day periods, one a weekday and the other a weekend day. In total, 282 respondents kept a diary for at least one day. Data extracted from these time use diaries is used to analyse not just the determinants of participation, but also the factors affecting the time allocated to civic related and voluntary activities. Poor quality diaries with fewer than 80 completed episodes were discounted leaving 261 weekday diaries and 259 weekend diaries (a total of 520 usable diaries) for analysis. To facilitate the specific research question in this chapter and the analysis in this section, the data is not analysed separately for weekdays and weekend days, though a variable is included which controls for the day of the week. It is hypothesised that an individual faces two sequential, and possibly interrelated, decisions: 1) whether or not to participate in leisure activities and 2) how much time to allocate for these activities. The first stage is a discrete choice of allocating any time to voluntary activities during an observed diary day. Once the decision to participate has been made, the second stage involves selecting the amount of time to devote to the activity.

Tables 8-7, 8-8 and 8-9 provide estimates of the double-hurdle models for participation in civic related activities, informal voluntary activities and volunteering in general (the sum of the minutes spent in civic activities and informally helping other households). The first column presents the marginal effects for the probit selection equation and the coefficient estimates for the OLS regression are presented in column three. The dependent variable in the OLS model is the number of minutes, thus, the estimates are expressed in linear minutes. For both models, the standard errors and the robust standard errors are presented (columns two and four). The insignificance of all of the variables in the OLS models for civic related activities and informal volunteering is most likely a function of the small sample size in these regressions. Only 39 respondents participated in civic activities and 44 did some form of informal volunteering on the diary days. With regard to volunteering in general, 79 respondents reported participating in either civic activities or informal volunteering and six variables were significant in the OLS regression model (see Table 8-9).

In terms of volunteering in general (measured by participation in either civic related activities or informal voluntary work), the key factors that influence participation include income, level of education, employment status, marital status, number of hours allocated to farm work per week and farm size. In the case of marital status, hours worked on the farm per week and farm size, the relationship is significant and positive. Being retired is also significantly and positively related to volunteering in general compared to being employed and not farming. The relationship between household income, level of education and size of community is significant and negative. That is to say, farm household members with higher levels of education, higher income levels and living in villages or towns of greater than 500 people are less likely to volunteer. The key factors influencing the level of participation in voluntary activities are income, level of education, number of children, gender, number of hours allocated to working off the farm and living alone. Higher levels of household income, larger families and living alone are significantly negatively related to the level of participation in volunteering in general. On the other hand, higher levels of education, being female and working more than 31 hours per week off the farm are associated with higher levels of participation in volunteering in general. Though these results are somewhat consistent with the available empirical literature, there are clear differences between civic engagement and informal volunteering.

Once participation has been estimated, it is possible to estimate the number of hours allocated to civic related activities, informal voluntary activities and volunteering (that is, participation in either civic related activities or informal voluntary activities). With regard to the number of hours spent doing civic related and informal voluntary activities, there were no significant relationships between the allocation of time to these activities and the predictor variables though, as stated previously, there is a small sample size in these regressions. Looking at time allocated to voluntary activities as a whole, it is found that higher levels of income, having a larger family and living alone all significantly reduce the number of hours spent on voluntary activities. Level of education, working greater than 31 hours per week off the farm and being female significantly increase the time allocated to voluntary activities.

Across the literature, education is a key determinant of the decision to engage civically and to volunteer and in the choice of hours of allocate to these activities (Smith, 1994; Wilson and

Musick, 1997b; Carr, 2001). The estimated coefficients in the double-hurdle model show a significant negative relationship between informal volunteering and level of education. That is to say, the more highly educated the respondent, the less likely they are to help other households informally. This is reflected in the model for volunteering in general though the result is significant for those who have completed the group or junior certificate only. Education has no clear impact on participation or hours allocated to civic related activities. The findings for informal volunteering and volunteering in general are interesting as level of education is usually positively associated with participation in voluntary activities in the literature (Vaillancourt, 1994; Healy, 2005), though recent studies have indicated that this effect is disappearing (Smith, 2006; Van Ingen and Dekker, 2011). It can be argued that informal volunteering is negatively associated with level of education because informal volunteering does not require the level of skill that formal volunteering sometimes demands and skill is correlated with education.

As income is highly correlated with level of education, it is not surprising that the findings for income are similar to those for education. There is a significant inverse relationship between levels of household income and participation in volunteering in general, civic engagement and informal volunteering, though the relationship is only significant and negative for those with household incomes of €50,000 or over for informal volunteering. These findings are consistent with rational choice theory that assumes that volunteer participation and hours are negatively related to income because opportunity costs rise as incomes rise. It also supports Brown and Lankfords' (1992) suggestion that income may not be a critical determinant of volunteering and Carlin's (2001) finding that rising wages caused a reduced incidence of volunteering. Level of participation follows the same pattern as participation, that is, higher levels of income are negatively related to hours spent volunteering. The result is significant for farm household members with a household income of over €70,000 and for volunteering in general only.

Differences in employment status reveal an interesting pattern, though the results are consistent with the results for income. Compared to those who are employed and not farming, people who are retired are most likely to volunteer. This result is significant for volunteering in general and informal volunteering only. It can be argued that those who are retired have

more free time and thus more time to help others informally. The other groups, except the self-employed, showed a positive, but not significant, association with volunteering. These findings corroborate those by Van Ingen and Dekker (2011) though previous research has found that the lowest rates of volunteering are among those not in the labour force at all, the unemployed or homemakers for example (Segal, 1993; Smith, 1994; Freeman, 1997; Wuthnow, 1998). Overall, there is no clear pattern between level of participation and employment status and the results are insignificant.

In line with a priori expectations and previous studies, marital status has a significant and positive effect on civic engagement, informal volunteering and thus volunteering in general. That is, farm household members who are married or have a partner are more likely to participate in voluntary activities, be they formal or informal. Consistent with expectations, the estimated coefficients for number of children are negative for participation and level of participation across the three voluntary activity groups but statistically significant for hours of participation in volunteering only. These estimates suggest that increased family size decreases the number of hours allocated to volunteering in general. These results support the findings of previous studies (Carlin, 2001; Garcia and Marcuello, 2002). The effect of gender on participation is insignificant though being female is found to have a positive and significant affect on the level of participation in volunteering in general. Females who participate in either formal of informal voluntary activities allocate more time to these activities than males do.

Religiosity has a negative and significant effect on informal volunteering, a negative but insignificant effect on volunteering in general and a positive but insignificant effect on civic engagement. The estimated coefficients suggest that being religiously active significantly decreases the likelihood of participation in informal volunteering and thus in volunteering in general. Religiosity is usually a strong determinant of volunteering (Wilson and Janoski, 1995; De Hart and Dekker, 2002; Ruiter and De Graaf, 2006). It is suggested that this is because belonging to a religious community enlarges peoples' social networks and stimulates altruistic values (Bekkers, 2008). However, Van Ingen and Dekker (2011) note the decline in church attendance in Western countries since the 1960s and suggest that the effect of church attendance may become stronger or weaker as a result of this. They argue that those who stay

involved with the church will have stronger beliefs and dedication, and thus volunteer more but that those who leave the church will be more inclined to volunteer than those who did not go to church in the first place because their values still resemble the values of churchgoers. Ireland has seen a 98% increase in the number of people identifying themselves as having no religion in the nine years between 2002 and 2011 (CSO, 2012b). Thus, it could be argued that these are plausible explanations for the positive and negative effects of religiosity on civic engagement and informal volunteering respectfully.

Differences in rootedness or length of time living or farming in one's community show an interesting pattern. Living or farming in one's community for greater than 50 years has a significant and positive effect on participation in civic related activities but a significant and negative effect on helping others informally. It can be argued that the longer an individual resides in a community and the more people they meet, the more likely they are to acquire knowledge of the civic and voluntary possibilities that are available to them. Another way of interpreting this is that the longer an individual is residing in an area, the more people in the community and voluntary sector they know and the more likely they are to be asked to participate in voluntary and community activities. Rootedness does not significantly impact the time spent on civic engagement. This is not surprising as, a priori, it was expected that rootedness would play a greater role in increasing knowledge of volunteering possibilities in the community with little impact on the amount of time allocated to civic engagement activities. Consistent with expectations, size of community is found to have a negative impact on the participation in civic engagement. Smaller towns or villages tend to increase the chance of engaging civically. Small towns are often portrayed as close-knit groups who interact with friends more often and in closer ways than people in larger towns and villages. It has been argued that people in smaller towns have a greater sense of belonging to a community and a greater sense of what goes on in that community (Mueller, 1975; Putnam, 2000). This increased feeling of community leads to an increased chance of civic and voluntary activities being performed.

Refuting the constraints side of the time allocation perspective, this analysis finds that hours spent on farm work are positively and significantly associated with participation in volunteering, civic activities and informal volunteering. This analysis also finds that farm

household members who work off-farm and allocate greater than 31 hours per week to off-farm work allocate significantly more time to volunteering in general than those who do not spend any time in off-farm employment. These results are consistent with Freeman (1997) and Wilson and Musicks' (1997a) findings that people faced with greater time pressure are more and not less likely to volunteer. The association between having an off-farm job and participation in civic related activities is significant and negative, but the association between having an off-farm job and informal volunteering is insignificant and positive. The finding in relation to civic related activities is consistent with that of Goss (1999), Rossi (2001) and Taniguchi (2006) who consider that time allocated to market work is a constraint on the participation and the level of participation in voluntary activities. However, the positive association between informal help and having an off-farm job supports Freeman (1997) and Wilson and Musicks' (1997a) finding that multiple job holders, usually faced with greater time pressure, are more and not less likely to volunteer. This can be explained in part by the social network being considered. Farm household members who work off the farm may be more likely to help other households informally as they may receive a larger benefit from helping others households, for example they can get assistance from others when they need it. Alternatively, respondents with off farm jobs may be less likely to engage civically because they help others informally and this places further constraints on their time.

Social trust has a positive and insignificant association with civic engagement but a negative and significant association with participation in informal voluntary activities. The negative association between helping other households informally and social trust is somewhat counterintuitive, though Oliver (1984) argues that it is a lack of trust in others to do what is right that spurs people to take action. Taniguchi and Marshall (2012) offer a further explanation by suggesting that the effect of social trust on civic engagement depends on the social context. They note that in societies where group affiliation and cooperation among in-group members are highly valued, social trust may do little to promote pro-social behaviours. The positive relationship between living alone and volunteering and in particular the statistically significant positive relationship between living alone and informal volunteering is consistent with expectations. Respondents living alone may have limited social contact with others and thus volunteer informally in order to meet other people.

Table 8-7 Results of Double-Hurdle Model for Civic Activities

	Probit Margins Participation		OLS y > 0 condit.	
	dy/dx	Delta-Method Std. Error	min/day	Robust Std. Error
Total Income Ref: €0 - €9,999				
€10,000-€29,999	**-0.09 ***	0.05	-480.56	690.33
€30,000-€49,999	-0.04	0.07	-1693.31	1139.93
€50,000-€69,999	**-0.09 ***	0.06	-891.32	911.05
> €70,000	0.01	0.07	-1586.587	902.57
Education Ref: Primary or Less				
Group/Inter/Junior Cert	-0.03	0.04	975.87	574.11
Leaving Cert	0.02	0.05	266.91	201.10
Post Leaving Cert/Diploma	0.09	0.07	-693.88	744.13
Third Level Degree or Higher	-0.03	0.06	-697.03	1676.73
Employment Status Ref: Emoloyed (not farming)				
Self-employed (inc. full-time farmers)	-0.10	0.10	-1082.26	603.14
Employed & Part-Time Farming	0.16	0.11	183.10	1385.07
Retired	0.01	0.13	-249.39	428.85
Unemployed/Homemaker/Student	-0.02	0.11	186.42	309.44
Age Ref: 19-60 yrs				
61+ yrs	0.05	0.04	188.28	148.49
Marital Status Ref: Separated/Single/Widowed				
Married/Partner	**0.18 ***	0.10	1583.21	1072.53
Number of Children	-0.01	0.01	-343.11	179.72
Religious Activity Ref: No				
Yes	0.02	0.03	-210.00	403.89
Distance from nearest Village or Town (km)	0.00	0.00	-37.81	35.87
Living in the Community Ref: 1-50 years				
51 – 100 years	0.03	0.03	-256.98	862.65
100 + years	**0.07 ***	0.04	374.31	402.40
Size of Community Ref: Village < 500 people				
Village or Town of 500 people or more	**-0.09 ****	0.04	-80.49	155.65
Gender Ref: Male				
Female	-0.02	0.05	-307.89	246.39
Day Ref: Weekday				
Weekend Day	-0.01	0.03	210.00	403.89
Season Ref: Winter				
Spring	0.08	0.07	123.72	181.89
Summer	0.06	0.05	-812.03	573.01
Autumn	-0.01	0.04	-135.13	268.62
Off-Farm Job Ref: No				
Yes	**-0.17 ****	0.08	354.80	1015.61
Off-Farm Job (hrs worked per wk) Ref: 0 hrs				
Between 1 & 31hrs	0.19	0.12	-	-
Greater than 31hrs	-0.00	0.04	-	-
Farmwork (hrs worked per wk) Ref: 0-8 hrs				
9-17hrs	**0.12 ***	0.06	-	-
18-26hrs	0.08	0.05	-	-
27-35hrs	0.05	0.04	-	-
> 36hrs	**0.08 ***	0.05	-	-
Size of Farm (ha)	0.00	0.00	-	-
Rushed Ref: No				
Yes	0.04	0.04	-848.56	613.72
Self-Rated Health: Good				
Poor	0.03	0.04	-	-
Self-Rated Quality of Life: Good				
Poor	0.05	0.04	-	-
Trust Index Ref: Low				
High	0.05	0.04	-	-
Informal Sociability Ref: Low				
High	0.01	0.03	-	-
Living Alone Ref: No				
Yes	-	-	-	-
Constant	-4.79 ***		1047.714	
Log Liklelihood	-66.8768		-	
Pseudo R-squared/R-squared	0.2724		0.9194	
Observations	376		29	

Asterisks indicate levels of significance: * p<0.1, **p<0.05, and *** p<0.01

Table 8-8 Results of Double-Hurdle Model for Informal Voluntary Activities

	Probit Margins Participation		OLS y > 0 condit.	
	dy/dx	Delta-Method Std. Error	min/day	Robust Std. Error
Total Income Ref: €0 - €9,999				
€10,000-€29,999	0.02	0.05	90.54	110.10
€30,000-€49,999	0.05	0.06	-2.97	84.44
> €50,000	**-0.07** *	0.04	-184.19	289.18
Education Ref: Primary or Less				
Group/Inter/Junior Cert	**-0.16** ***	0.06	57.50	71.35
Leaving Cert	-0.08	0.07	110.43	58.91
Post Leaving Cert/Third Level	**-0.17** ***	0.06	-95.12	244.42
Employment Status Ref: Emoloyed (not farming)				
Self-employed (inc. full-time farmers)	-0.02	0.06	-153.39	490.25
Employed & Part-Time Farming	0.05	0.07	-31.57	225.94
Retired	**0.45** ***	0.12	-33.27	378.13
Unemployed/Homemaker/Student	0.04	0.07	-68.97	217.96
Age Ref: 19-60 yrs				
61+ yrs	0.04	0.04	-96.35	98.21
Marital Status Ref: Separated/Single/Widowed				
Married/Partner	**0.37** ***	0.10	-216.33	234.96
Number of Children	-0.01	0.01	-15.49	34.96
Religious Activity Ref: No				
Yes	**-0.07** *	0.04	-44.76	76.86
Distance from nearest Village or Town (km)	-0.00	0.00	-8.47	9.32
Living in the Community Ref: 1-50 years				
51 – 100 years	**-0.16** **	0.06	-97.32	139.76
100 + years	**-0.11** *	0.07	-98.36	171.78
Size of Community Ref: Village < 500 people				
Village or Town of 500 people or more	**-0.06** *	0.04	109.80	82.26
Gender Ref: Male				
Female	0.01	0.05	-122.51	246.18
Day Ref: Weekday				
Weekend Day	-0.02	0.03	-25.28	43.02
Season Ref: Winter				
Spring	0.04	0.06	17.39	111.01
Summer	-0.06	0.05	19.11	77.89
Autumn	-0.03	0.05	-81.18	56.57
Off-Farm Job Ref: No				
Yes	0.04	0.07	36.83	174.98
Off-Farm Job (hrs worked per wk) Ref: 0 hrs				
Between 1 & 31hrs	-0.01	0.07	170.28	268.81
Greater than 31hrs	-0.05	0.04	-17.66	137.70
Farmwork (hrs worked per wk) Ref: 0-8 hrs				
9-17hrs	**0.14** **	0.06	79.93	148.94
18-26hrs	**0.09** *	0.05	210.42	125.20
27-35hrs	0.04	0.03	39.75	115.10
> 36hrs	**0.13** ***	0.05	219.45	197.06
Size of Farm (ha)	**0.01** ***	0.00	1.15	2.39
Rushed Ref: No				
Yes	0.02	0.04	-	-
Self-Rated Health: Good				
Poor	0.02	0.04	-	-
Self-Rated Quality of Life: Good				
Poor	-0.02	0.04	-	-
Trust Index Ref: Low				
High	**-0.06** *	0.03	-	-
Informal Sociability Ref: Low				
High	0.01	0.03	-	-
Living Alone Ref: No				
Yes	**0.22** **	0.10	-	-
Constant	-4.69 ***		413.2556	
Log Liklelihood	-70.38932			
Pseudo R-squared/R-squared	0.3704		0.9579	
Observations	376		34	

Asterisks indicate levels of significance: * p<0.1, **p<0.05, and *** p<0.01

Table 8-9 Results of Double-Hurdle Model for Volunteering in General

	Probit Margins Participation		OLS y > 0 condit.	
	dy/dx	Delta-Method Std. Error	min/day	Robust Std. Error
Total Income Ref: €0 - €9,999				
€10,000-€29,999	-0.08	0.06	-179.62	128.05
€30,000-€49,999	-0.03	0.07	-139.41	128.88
€50,000-€69,999	**-0.13 ***	0.07	-92.59	122.16
> €70,000	**-1.12 ***	0.07	**-210.43 ***	101.89
Education Ref: Primary or Less				
Group/Inter/Junior Cert	**-0.14 ****	0.06	24.34	68.78
Leaving Cert	-0.03	0.07	18.32	66.45
Post Leaving Cert/Diploma	-0.05	0.07	**144.42 ***	70.83
Third Level Degree or Higher	-0.07	0.09	189.31	107.94
Employment Status Ref: Emoloyed (not farming)				
Self-employed (inc. full-time farmers)	-0.05	0.08	43.78	115.03
Employed & Part-Time Farming	0.14	0.09	-77.32	101.13
Retired	**0.31 ****	0.14	60.64	103.39
Unemployed/Homemaker/Student	0.07	0.10	6.03	101.70
Age Ref: 19-60 yrs				
61+ yrs	0.04	0.05	71.72	65.95
Marital Status Ref: Separated/Single/Widowed				
Married/Partner	**0.52 *****	0.14	-92.80	218.60
Number of Children	-0.1	0.01	**-41.18 ****	19.05
Religious Activity Ref: No				
Yes	-0.03	0.04	72.65	68.36
Distance from nearest Village or Town (km)	0.00	0.00	2.71	4.74
Living in the Community Ref: 1-50 years				
51 – 100 years	-0.10	0.06	9.73	73.39
100 + years	0.04	0.06	-3.70	62.35
Size of Community Ref: Village < 500 people				
Village or Town of 500 people or more	**-0.12 *****	0.05	-132.78	89.66
Gender Ref: Male				
Female	-0.04	0.06	**167.02 ****	67.82
Day Ref: Weekday				
Weekend Day	-0.04	0.04	11.46	71.54
Season Ref: Winter				
Spring	0.11	0.07	96.67	107.02
Summer	0.01	0.06	-15.38	69.71
Autumn	-0.03	0.05	-86.76	76.35
Off-Farm Job Ref: No				
Yes	-0.06	0.09	140.75	173.80
Off-Farm Job (hrs worked per wk) Ref: 0 hrs				
Between 1 & 31hrs	0.05	0.10	99.49	122.05
Greater than 31hrs	-0.05	0.06	**135.49 ***	74.49
Farmwork (hrs worked per wk) Ref: 0-8 hrs				
9-17hrs	**0.14 ****	0.06	133.07	139.93
18-26hrs	**0.16 ****	0.08	168.65	163.27
27-35hrs	0.05	0.05	54.68	107.28
> 36hrs	**0.05 ****	0.06	236.10	165.00
Size of Farm (ha)	**0.01 ****	0.00	0.26	1.35
Rushed Ref: No				
Yes	0.04	0.05	-105.55	83.58
Self-Rated Health: Good				
Poor	0.03	0.05	110.27	74.33
Self-Rated Quality of Life: Good				
Poor	-0.01	0.05	-84.00	70.17
Trust Index Ref: Low				
High	-0.01	0.04	61.09	54.56
Informal Sociability Ref: Low				
High	0.04	0.04	10.29	41.96
Living Alone Ref: No				
Yes	0.21	0.15	**-331.11 ***	176.17
Constant	-3.87 ***		27.03	
Log Liklelihood	-114.35668			
Pseudo R-squared/R-squared	0.2609		0.7202	
Observations	376		54	

Asterisks indicate levels of significance: * p<0.1, **p<0.05, and *** p<0.01

8.5.4 Ordinary Least Squares Models

As indicated in Section 8.3.5, there are several challenges that arise when modelling daily time use decisions. The large number of zero responses in time use data is a common problem in data analysis. The most straightforward approach for modelling the prevalence of zero observations and the sequential participation and time use decisions of respondents is the double-hurdle model, the results of which are discussed in Section 8.5.3. It should be noted that the number of respondents that reported participation in voluntary activities in the time use diaries was small. Thus, there is a particularly small sample size in the OLS regressions in the second part of the double-hurdle models in Section 8.5.3, possibly restricting the accuracy of the double-hurdle model of predicting the determinants of volunteering. This is because the OLS model is applied only to a subsample of the dataset, those who participated in the activity of interest. The small number of observations may be due to the fact that each individual completed diaries on only two days and civic activities, informal voluntary activities and volunteering in general are activities that participants do not necessarily engage in on a daily basis.

Gershuny (2012) suggests that a more directly controllable OLS regression approach rather than the mixed modelling double-hurdle approach used in Section 8.5.3 could produce more robust results. Tables 8-10, 8-11 and 8-12 provide the coefficient estimates of the OLS regressions for the level of participation in civic related activities, informal voluntary activities and volunteering in general (the sum of the minutes spent in civic activities and informally helping other households). The dependent variable in the OLS model is the number of minutes, thus, the estimates are expressed in linear minutes. For each model, the robust standard errors are presented.

In terms of volunteering in general (Table 8-10), the key factors that influence the level of participation are level of education, employment status, number of children, and number of hours allocated to farm work per week. Having completed the junior certificate is significantly and negatively related to time allocated to voluntary activities compared to having completed primary school education only. The relationship between self-employment (including full-time farming) and time allocated to voluntary activities in significant and

negative, that is to say, farm household members who are self-employed allocate less time to voluntary activities than those who are employed and not farming. Number of children is significantly and negatively related to time allocated to voluntary activities. The number of hours allocated to farmwork is significantly and positively related to time allocated to voluntary activities. These results are not consistent with the results from the double-hurdle model in Section 8.5.3. In the case of the effect of level of education, employment status and number of children, the determinants of the allocation of time work in opposite directions in each model. The relationship between hours worked on the farm and time allocated to voluntary activities is consistent with the double-hurdle model though the results are not significant in the double-hurdle model. In the case of the double-hurdle model, six variables are significantly related to level of volunteering however the results from the OLS model suggest that just four variables are significantly related to the level of volunteering.

Turning to civic activities (Table 8-11), the OLS model suggests that number of children is significantly and negatively related to level of participation. This is consistent with the results from the double-hurdle model though the result is not significant in the double-hurdle model. Compared to level of participation in civic activities during the winter, there is a significant and positive relationship between level of participation during the summer months. This result is not consistent to the double-hurdle model where compared to the months of winter time allocated to civic activities decreases during the summer months.

The OLS model reveals that level of education and distance from ones community are significantly and negatively related to time allocated to informal voluntary activities (Table 8-12). That is to say, a higher level of education decreases time allocated to informal volunteering and so too does the number of years that a farm household member has resided in their community. Being retired is significantly and positively related to time allocated to informal volunteering while time allocated to farmwork is also significantly and positively related to level of informal volunteering. These results are consistent with those from the double-hurdle models though there are no significant predictors of level of participation in informal voluntary activities in the double-hurdle model.

Table 8-10 Results of OLS Model for Civic Activities

	OLS	
	min/day	Robust Std. Error
Total Income Ref: €0 - €9,999		
€10,000-€29,999	-8.74	7.21
€30,000-€49,999	-8.00	8.03
€50,000-€69,999	-10.14	8.56
> €70,000	-6.83	8.31
Education Ref: Primary or Less		
Group/Inter/Junior Cert	-3.39	6.61
Leaving Cert	2.22	7.46
Post Leaving Cert/Diploma	8.68	8.04
Third Level Degree or Higher	4.16	10.35
Employment Status Ref: Emoloyed (not farming)		
Self-employed (inc. full-time farmers)	-14.26	10.19
Employed & Part-Time Farming	-3.04	9.32
Retired	3.25	12.38
Unemployed/Homemaker/Student	0.69	10.25
Age Ref: 19-60 yrs		
61+ yrs	-5.25	5.97
Marital Status Ref: Separated/Single/Widowed		
Married/Partner	2.34	8.23
Number of Children	**-2.14 ***	1.28
Religious Activity Ref: No		
Yes	7.45	5.29
Distance from nearest Village or Town (km)		0.63
Living in the Community Ref: 1-50 years		
51 – 100 years	6.91	7.18
100 + years	3.29	6.48
Size of Community Ref: Village < 500 people		
Village or Town of 500 people or more	-7.11	5.37
Gender Ref: Male		
Female	-8.42	7.39
Day Ref: Weekday		
Weekend Day	-0.85	4.71
Season Ref: Winter		
Spring	5.40	6.83
Summer	**13.71 ***	7.04
Autumn	-4.29	6.53
Off-Farm Job Ref: No		
Yes	-5.18	9.95
Off-Farm Job (hrs worked per wk) Ref: 0 hrs		
Between 1 & 31hrs	-2.96	10.00
Greater than 31hrs	-8.56	7.37
Farmwork (hrs worked per wk) Ref: 0-8 hrs		
9-17hrs	11.56	8.45
18-26hrs	14.41	9.26
27-35hrs	6.19	8.89
> 36hrs	7.18	8.81
Size of Farm (ha)	0.04	0.09
Rushed Ref: No		
Yes	6.02	6.37
Self-Rated Health: Good		
Poor	2.74	6.48
Self-Rated Quality of Life: Good		
Poor	2.88	6.54
Trust Index Ref: Low		
High	4.61	5.11
Informal Sociability Ref: Low		
High	4.36	4.73
Living Alone Ref: No		
Yes	-	-
Constant	23.95	
R-squared	0.1153	
Observations	376	

Asterisks indicate levels of significance: * p<0.1, **p<0.05, and *** p<0.01

Table 8-11 Results of OLS Model for Informal Voluntary Activities

	OLS	
	min/day	**Robust Std. Error**
Total Income Ref: €0 - €9,999		
€10,000-€29,999	0.58	4.97
€30,000-€49,999	-0.74	5.66
> €50,000	-7.08	5.15
Education Ref: Primary or Less		
Group/Inter/Junior Cert	**-10.28 ****	4.67
Leaving Cert	-2.75	5.25
Post Leaving Cert/Third Level	-8.56	5.34
Employment Status Ref: Emoloyed (not farming)		
Self-employed (inc. full-time farmers)	-3.91	7.15
Employed & Part-Time Farming	4.21	6.52
Retired	**19.97 ****	8.71
Unemployed/Homemaker/Student	-2.89	7.20
Age Ref: 19-60 yrs		
61+ yrs	4.55	4.17
Marital Status Ref: Separated/Single/Widowed		
Married/Partner	9.26	6.50
Number of Children	-0.97	0.91
Religious Activity Ref: No		
Yes	-5.93	3.72
Distance from nearest Village or Town (km)	-0.26	0.44
Living in the Community Ref: 1-50 years		
51 – 100 years	**-13.01 *****	5.04
100 + years	**-7.92 ***	4.54
Size of Community Ref: Village < 500 people		
Village or Town of 500 people or more	-1.24	3.73
Gender Ref: Male		
Female	5.98	5.16
Day Ref: Weekday		
Weekend Day	-4.54	3.32
Season Ref: Winter		
Spring	-1.10	4.81
Summer	-4.92	4.89
Autumn	-2.79	4.60
Off-Farm Job Ref: No		
Yes	-2.61	6.93
Off-Farm Job (hrs worked per wk) Ref: 0 hrs		
Between 1 & 31hrs	8.02	7.02
Greater than 31hrs	5.08	5.22
Farmwork (hrs worked per wk) Ref: 0-8 hrs		
9-17hrs	**14.12 ****	5.89
18-26hrs	**12.26 ***	6.48
27-35hrs	6.90	6.25
> 36hrs	**14.78 ****	6.23
Size of Farm (ha)	0.10	0.06
Rushed Ref: No		
Yes	0.24	4.46
Self-Rated Health: Good		
Poor	1.95	4.56
Self-Rated Quality of Life: Good		
Poor	1.06	4.62
Trust Index Ref: Low		
High	-4.21	3.51
Informal Sociability Ref: Low		
High	2.62	3.27
Living Alone Ref: No		
Yes	-7.18	10.22
Constant	4.98	
R-squared	0.1517	
Observations	376	

Asterisks indicate levels of significance: * p<0.1, **p<0.05, and *** p<0.01

Table 8-12 Results of OLS Model for Volunteering in General

	OLS	
	min/day	**Robust Std. Error**
Total Income Ref: €0 - €9,999		
€10,000-€29,999	-10.36	11.58
€30,000-€49,999	-9.91	11.72
€50,000-€69,999	-14.78	11.78
> €70,000	-18.19	12.54
Education Ref: Primary or Less		
Group/Inter/Junior Cert	**-13.44 ***	8.03
Leaving Cert	-0.04	10.67
Post Leaving Cert/Diploma	-2.50	10.31
Third Level Degree or Higher	3.23	13.63
Employment Status Ref: Emoloyed (not farming)		
Self-employed (inc. full-time farmers)	**-16.94 ***	9.68
Employed & Part-Time Farming	0.10	9.90
Retired	22.65	15.63
Unemployed/Homemaker/Student	-0.34	10.80
Age Ref: 19-60 yrs		
61+ yrs	-0.22	8.29
Marital Status Ref: Separated/Single/Widowed		
Married/Partner	8.63	12.07
Number of Children	**-3.16 ****	1.58
Religious Activity Ref: No		
Yes	1.05	6.86
Distance from nearest Village or Town (km)	-0.26	0.76
Living in the Community Ref: 1-50 years		
51 – 100 years	-6.02	8.72
100 + years	-4.47	7.19
Size of Community Ref: Village < 500 people		
Village or Town of 500 people or more	-8.88	6.88
Gender Ref: Male		
Female	-3.44	7.83
Day Ref: Weekday		
Weekend Day	-5.10	4.52
Season Ref: Winter		
Spring	4.46	8.67
Summer	9.38	9.87
Autumn	-6.60	6.02
Off-Farm Job Ref: No		
Yes	-5.77	9.57
Off-Farm Job (hrs worked per wk) Ref: 0 hrs		
Between 1 & 31hrs	5.23	11.99
Greater than 31hrs	-2.80	9.78
Farmwork (hrs worked per wk) Ref: 0-8 hrs		
9-17hrs	**23.91 ***	12.30
18-26hrs	**26.60 *****	10.32
27-35hrs	12.40	9.03
> 36hrs	**21.80 ****	9.85
Size of Farm (ha)	0.11	0.08
Rushed Ref: No		
Yes	7.38	7.06
Self-Rated Health: Good		
Poor	4.68	7.71
Self-Rated Quality of Life: Good		
Poor	3.82	7.63
Trust Index Ref: Low		
High	1.72	5.69
Informal Sociability Ref: Low		
High	7.86	6.22
Living Alone Ref: No		
Yes	-15.14	15.54
Constant	30.72	
R-squared	0.1432	
Observations	376	

Asterisks indicate levels of significance: * p<0.1, **p<0.05, and *** p<0.01

8.5.5 Summary of Results

According to the results of the logistic regression model, the odds of volunteering regularly significantly increase with level of education, age, level of informal sociability and number of hours worked on the farm per week. Being married also significantly increases the likelihood of regular volunteering. On the other hand, being employed and farming part time significantly decreases the likelihood of volunteering on a regular basis. The determinants of active community engagement are similar though age, number of hours worked on the farm per week and being employed and part-time farming are statistically insignificant but being retired significantly increases the likelihood of active community engagement. The logistic regression analysis demonstrates that farm size is significant and positively associated with civic engagement and distance from nearest village or town is significant and negatively associated with civic engagement.

In line with expectations, the double-hurdle estimation reveals that the participation in civic and voluntary activities is governed by two independent decisions: the decision to participate and the decision on the allocation of time. The estimation results also show that individual, economic, household and farm characteristics as well as indicators of social capital relate differently to participation and time investment decisions of farm household members and sometimes have opposite effects. Level of education is an example of the latter: higher levels of education decrease the likelihood of participation in voluntary activity, however they simultaneously increase the time invested in voluntary activities.

The results of the double-hurdle models reveal that a number of the respondent's characteristics (education, marital status and hours worked on the farm per week), economic characteristics (household income and employment status), and one household characteristic (community size) influence the likelihood of participation in volunteering in general. The level of participation or hours allocated to volunteering in general is associated with total household income, level of education, number of children, gender, the number of hours worked off the farm per week and whether the respondent is living alone. Level of household income and education, employment and marital status, religiosity, rootedness, size of community, number of hours allocated to farm work, level of trust and whether the

respondent is living alone are found to have a significant impact on participation in informal voluntary activities. Civic related activities, which include formal volunteering, are associated with level of income, marital status, rootedness, off-farm job and hours allocated to farm work per week.

The results from the analysis of the questionnaire data and the time diary data from the same sample of respondents confirm a number of results with respect to the determinants of volunteering. There are almost certainly gradients with respect to volunteering and level of education, marital status, being retired and working more hours on the farm. Both sets of analysis reveal that farm household members who are married are significantly more likely to volunteer than their single, widowed or separated counterparts. Respondents who are retired are also more likely to participate in voluntary activities. Spending more rather than less hours farming is also significant and positively related to volunteering across the two sets of analysis. Education has a significant and positive effect on volunteering in the logistic regression analysis however the double-hurdle model, which disaggregates formal and informal volunteering, reveals that education is inversely related to informal volunteering.

There are however a number of differences between the results from the time use diaries and the results from the individual questionnaires. This is most likely because, as noted previously, civic engagement and volunteering are not activities that are done on a regular basis. Therefore, time use diaries, particularly time use diaries that cover only two days, may not paint an accurate picture of civic engagement and voluntary behaviours of respondents. On the other hand, frequency of participation questions relating to participation in civic engagement and voluntary activities tend to have a high degree of error (U.N.S.D., 2005). This can occur because of the basic problem of perception in a respondent's ability to provide accurate information. Thus, time diary data compliments conventional measures of civic engagement and voluntary activity and this analysis goes some way towards showing that this is the case. From a methodological point of view and in line with Gershuny (2012), in order to collect accurate information, it is suggested that future research should use time use diaries, frequency of participation and stylised questions to collect data on civic engagement and volunteering.

8.6 Discussion

This chapter makes a number of important contributions to the currently available literature. This is the first study using a time diary methodology that paints a picture, in an Irish rural context, of the determinants of and the extent of involvement of farm household members in civic and voluntary activities. Although the results are not representative of all of rural Ireland, they nevertheless provide interesting observations leading to important conclusions which can potentially contribute to further and more comprehensive studies in other regions of rural Ireland. One of the advantages of this study is the accuracy of the time use diary data combined with data from the individual questionnaire. This research contributes to the literature by highlighting that, consistent with emerging literature, the determinants of volunteering are changing and in some cases are no longer consistent with traditional and seminal literature on the determinants of volunteer activity. The findings offer insights into the considerations that should be included in policies that seek to improve the well-being of the rural population and promote rural sustainability. This study has also brought to light the uniquely rural conditions that affect volunteering and civic engagement and highlighted the need for future research to examine volunteering through a variety of methods and by including informal volunteering in the analysis.

This analysis also has important implications for understanding social capital and its impact on the voluntary behaviour of farm household members. Looking at the different types of volunteering, regardless of the method of data collection or the techniques of analysis, it is unmistakable that social capital plays an important role. One new result from this chapter is that informal community links that already exist, due to farm household members visiting others or having others visit them, are likely to have a positive association with the decision of farm household members to participate in voluntary and community activities. This research also finds that individuals with greater stocks of social capital do not necessarily volunteer more. The effect of social capital depends on the indicator of social capital used in the analysis, on social context and on the group of individuals to which it is being applied. For example, social trust as an indicator of social capital has a positive association with civic engagement of farm household members but a negative association with participation in informal voluntary activities.

In the logistic regression analysis, farm size is positively associated with the likelihood of participation in voluntary and civic related activities, though the result is significant for civic engagement only. The double-hurdle models produce similar results. Farm size is positively associated with the participation in and the level of participation in voluntary activities, though the result is significant for participation only. This suggested link between larger farms and/or informal links with one's community and a deeper involvement in voluntary and community networks is an interesting link from a rural development policy perspective. For public policy programs that seek to improve the well-being of the rural population and promote rural sustainability, it seems important to note that social capital generation may be cumulative in the sense that greater involvement with others in one sphere seems likely to lead to greater involvement in other spheres.

One of the most substantial findings of this research is that farm household members who participate in voluntary activities, either in a formal or informal capacity, spend just over two standard working days volunteering over the course of a year. Thus, the policy implications for voluntary and community organisations in rural areas, trying to improve their ability to develop effective and efficient volunteer management strategies, is the better understanding of who is likely to volunteer, and among volunteers, who is likely to devote substantial amounts of time to this form of unpaid work. The analysis indicates that the most important factors affecting the probability that a farm household member will volunteer is their employment and marital status. An implication of this finding is that communities seeking to increase the level of volunteering can emphasise that volunteering is an important way through which people connect with one another and that it is also an important method of providing services and meeting critical needs of communities that are not met by other means.

Finally, the limitations of the analysis in this chapter should be discussed. The number of respondents that reported participation in voluntary activities in the time use diaries was small, possibly restricting the accuracy of the double-hurdle model of predicting the determinants of volunteering. Thus, caution should be exercised when making conclusions about civic engagement or volunteering based on time use data alone. Time use diaries miss infrequent activities, such a civic engagement or volunteering, as they are not necessarily activities that individuals engage in on a daily basis. Despite this, it can be argued that

research on volunteering derived from time use diaries can provide additional valuable information due to the nature of the survey instrument and particularly when used in conjunction with individual questionnaire data. Finally, due to the cross-sectional nature of the data analysed, the estimated effects should be considered as associations as opposed to causal effects. Further econometric analysis is required in order to make inferences as to the causal effects of the individual, economic, household and farm characteristics as well as indicators of social capital on civic engagement and volunteering.

One potential extension for future research is to analyse the most appropriate unit of time (time horizon) for various voluntary activities, particularly given their sporadic and infrequent nature. Spissu (2009) proposes that free time activity participation may be characterised as being on a weekly rhythm. In this chapter, the potential weekly rhythm was partially taken into account by including a variable that differentiates between weekdays and weekend days in the daily participation probability and time use models. Overall, Vaara and Matero (2011) note that daily activity patterns can be viewed as the end result of a weekly activity scheduling process. Walsh *et al.* (1992) points out the relevance and importance of long run costs and sacrifices in annual participation decisions for outdoor recreation activities, however, an annual scheduling process implicit in modelling annual civic engagement and volunteer behaviour seems unrealistically long for individual decisions related to the majority of civic engagement activities. Thus, the need for research analysing the advantages and disadvantages of alternative time frames is important.

9. Modelling the Determinants of Participation in Leisure Activities

9.1 Introduction

As set out in Chapter 1, one of the main aims of this thesis is to investigate the level of engagement of farm household members in leisure activities. Time use data can be used to address the analysis leisure activities, a fertile area of research. There is a large body of literature that has drawn on time use data to examine differentials in the amount and use of leisure time across population groups, though studies investigating the allocation of time among different categories of leisure are limited in number and scope (Aguiar and Hurst, 2007; Lee and Bhargava, 2009; Ramey and Francis, 2009). Within this context, this chapter sets out to address a gap in the existing literature. The first objective is to examine the factors that influence the participation in, and the number of hours dedicated to, various leisure activities among farm household members in the West of Ireland. The use of a double-hurdle specification permits the analysis of the determinants of participation and level of participation decisions separately. The second objective is to investigate the diversity of participation in various types of leisure activities, specifically outdoor and active leisure activities, passive leisure and social entertainment. The results in this chapter are collated from data extracted from the time use diaries and the individual and household questionnaires in the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey*. The time diary methodology applied in this study provides valuable data for understanding the complexity of leisure time activities of farm household members in the West of Ireland.

Despite many definitions, reflecting a variety of philosophical and methodological fields, leisure time is most commonly referred to as the residual time available to people after they have fulfilled their work (paid and unpaid) and personal care commitments (Lundberg *et al.*, 1969; Szalai, 1972). The activities that people engage in during leisure time are sometimes referred to as recreational activities. These activities are an important means of coping with stress, recovering from the pressures of work and other commitments, and they enhance the health status of the individual (Trenberth and Dewe, 2002). Leisure activities can be

classified as either active or passive (Firestone and Shelton, 1988). Active leisure enhances one's physical health and productivity in the market as well as being desirable for its own sake. It includes such activities as sports, games, computer activities, arts and crafts, and exercise activities. On the other hand, leisure activities such as watching television, listening to the radio, or reading a book, are considered passive in nature. They typically require little or no social interaction or active engagement, are associated less with one's physical health, and have been shown to be less satisfying than active leisure activities (Juster, 1985a; Robinson, 1999b; Menec, 2003; Iso-Ahola and Mannell, 2004; Lampinen *et al.*, 2006). Passive leisure also lacks productivity increasing attributes, does not refresh like sleep, nor does it develop individual capabilities like active leisure (Biddle and Hamermesh, 1990). Dardis *et al.* (1994) describe a third category of leisure activity, social entertainment. Social entertainment includes attendance at spectator events such as sports events and going to the theatre and to museums, as well as engaging in discussion, talking and so on.

Several studies have argued that the availability and use of leisure time is an important dimension of societal well-being and is associated with benefitting different groups of people in a variety of ways (Dow and Juster, 1985; Kelly *et al.*, 1987; Robinson, 1999b; Menec, 2003). Participation in recreational activities enables people to develop their skills, talents and knowledge, and can provide them with a sense of identity and personal autonomy. Activities such as outdoor sports and active leisure can enhance people's health and contribute to a reduction in physical and mental health problems (like high blood pressure and depression). By supporting the formation of community networks and preventing social isolation, some leisure activities play an important role in the quality of life of the aging population (Kelly and Ross, 1989; Mannell, 1999; Tinsley *et al.*, 2002). For working people, participation in leisure activities can be a means of coping with work related stress (Trenberth and Dewe, 2002). Conversely, activities such as gambling and drug and alcohol abuse can have negative effects on physical and mental health, while activities such as graffiti and vandalism can detract from community well-being. Within this context, understanding time allocation patterns for leisure activities has broad ramifications for societal well-being.

The remainder of this chapter is organised as follows. An overview of the empirical literature that attempts to explain the motivations for participation in outdoor, passive and social

entertainment activities is presented in Section 9.2. Section 9.3 includes a description of the data and presents the estimation techniques. This is followed in Section 9.4 by a detailed description of the construction of the dependent and predictor variables used in the analysis. Section 9.5 presents the empirical results of the bivariate analysis and double-hurdle models, while Section 9.6 concludes the chapter with a discussion of the results and possible policy implications.

9.2 Literature

The study of leisure has generated a significant body of literature pertinent to the understanding of people's use of leisure and involvement in physical activity. A wide range of studies using time use data have considered trends in leisure activity participation, time allocation patterns of households across time and differentials in the amount and use of leisure time across population groups (Cushman *et al.*, 2005b; Aguiar and Hurst, 2007; McGinnity and Russell, 2007; Lee and Bhargava, 2009). In such studies, the choice between leisure activities has typically been modelled as arising from economic costs rather than the benefits of participation in different activities. A comprehensive review of the literature reveals that, for the most part, factors such as income, employment status, age, gender, marital status, and day of the week are significant determinants of participation in and time allocated to various categories of leisure activities.

Income variables are shown to have a limited effect on time spent in active leisure suggesting that the time spent on active leisure depends more on the amount of human capital than on the labour market rewards. People with higher education usually have higher income, and thus can afford more expensive leisure activities e.g. opera or concert tickets. Therefore, while income has little effect on time spent in active leisure activities, differences in disposable income due to varied educational levels effects the propensity to do certain active leisure activities (Kooreman and Kapteyn, 1987; Ruuskanen, 2004). It is worth noting that Gershuny (2005) makes the argument that due to the emergence of mass unemployment coupled with other social changes, 'busyness' is viewed as a badge of honour, though historically those who could afford a life of idleness held high societal status. Gershuny (2005) supports Becker's (1965) argument that time and goods are substitutable by stressing

the importance of paid work relative to leisure for privileged social positions. He argues that there has been a shift from leisure having high status to work having high status. Aguiar and Hurst (2007) bolster this hypothesis with evidence from the US articulating that the largest increase in leisure in the last forty years has been for the less educated. Thus, the overall effect of income on leisure time is inconclusive.

Education has a strong negative effect on the time allocated to passive television viewing (Ruuskanen, 2004). Robinson and Godbey (1997) find that in the United States, people with high school education watch twice as much television as those with a university degree. A study of the determinants of the increase in television viewing in Finland by Toivonen (2003) reveals similar results. Controlling for gender however, Kooreman and Kapteyn (1987) conclude that education has a small positive effect on the time spent listening to the radio, watching television and reading books for men, but decreases time spent on passive leisure activities for women. Conversely, they find that increased education decreases time spent on entertainment and social activities for men but has the opposite effect for women. Multinationally, Gershuny (2000) finds that the amount of time spent doing passive leisure activities has increased in all socioeconomic groups in the United States but the increase has been substantial in individuals with limited education but moderate in highly educated people. Thus, it is hypothesised that with other factors held constant, individuals with higher education levels would spend relatively more time on active leisure activities than those with lower education levels. Using Finnish time use data from 1999/2000, Ruuskanen (2004) supports this argument with his conclusion that education reduces the time spent on passive leisure but increases the time spent on active leisure.

Apart from education and income, various other factors also influence the time allocated to leisure activities. Research shows that the time use patterns of married people are significantly different from that of singles (Bryant and Zick, 2006). Studies by Thrane (2000) and Lee and Bhargava (2009) support Robinson and Godbey's (1997) finding that married people have less time for leisure when compared to unmarried people. Lee and Bhargava (2009) add that single individuals spend more time on active and passive leisure and social entertainment than married people. Time diary studies by Robinson and Godbey (1997) and Kleiber *et al.* (2011) have found that among Americans, television viewing dominates and

only a fraction of time is used in physically active forms of leisure. Their research also shows that the majority of free time is available on weekdays, not weekends. The demand for household production increases when there are children present in the household, reducing the time available for leisure activities (Holman and Epperson, 1984; Altergott and McCreedy, 1993; Thrane, 2000).

A curvilinear relationship exists between age and leisure time (Robinson and Godbey, 1997; Thrane, 2000). Age also has different effects depending on the type of leisure activity pursued. A negative association has been established between age and active leisure, whereas a positive relationship has been found between age and passive leisure (Firestone and Shelton, 1988; Dardis *et al.*, 1994). Several studies in Ireland and across Europe have reported a gender difference in the availability of leisure time, indicating that women have less leisure time than men (Bittman and Wajcman, 2000; Thrane, 2000; McGinnity *et al.*, 2005; McGinnity and Russell, 2008). In Finland, females participate in outdoor recreation activities more frequently compared to males, but females who participated spent less time on the activities (Vaara and Matero, 2011). In the United States, there exist considerable gender differences in the use of time for outdoor recreation (Siikamaki, 2009). Men are more likely to participate in outdoor activities and, if they do, they spend more time on outdoor recreation than women. Studying the influence of gender on leisure activity preferences of African Americans, Shinew *et al.* (1996) found similarities between leisure preferences of men and women in higher social classes, but not between those individuals in the lower social classes.

With regard to locational factors, Robinson and Godbey (1997) found that, in America at least, people living in rural areas have one hour less free time each week than people living in urban areas. They also found that people living in apartments have more free time, but mainly because they are less likely to be married or to have children. Temporal factors such as day of the week are also found to affect the time allocated to leisure activities. Americans allocated more time to leisure activities on weekend days than weekdays (Robinson and Godbey, 1997).

9.3 Methods

As discussed in Section 5.3.2, all respondents kept diaries for two 24-hour days, one a weekday and the other a weekend day. In total, 282 respondents kept a diary for at least one day. Data extracted from these time use diaries is used to analyse not just the determinants of the participation but also the factors affecting the time allocated to leisure activities. Poor quality diaries with fewer than 80 completed episodes were discounted leaving 261 usable weekday diaries and 259 usable weekend day diaries (a total of 520 usable diaries) for analysis. To facilitate the specific research question in this chapter, the data is not analysed separately for weekdays and weekend days though a variable is included which controls for the day of the week. This also makes the estimates comparable with other studies as weekday and weekend day time use is combined to give an 'average' day. It is hypothesised that an individual faces two sequential, and possibly interrelated, decisions: 1) whether or not to participate in leisure activities, and 2) how much time to allocate for these activities. The first stage is a discrete choice model of allocating any time to voluntary activities during an observed diary day. Once the decision to participate has been made, the second stage is selecting the amount of time to devote to the activity.

Section 8.3.3 presented a comprehensive discussion of the most straightforward approach to modelling sequential participation and time use decisions, the double-hurdle model (Cragg, 1971; Duan *et al.*, 1983). Double-hurdles models are the most frequently used models in the literature in relation to time use data. Wodjao (2007) and Vaara and Matero (2011) both show that the double-hurdle model, compared to the standard Tobit (Type I) and Heckman selection models, is the best econometric specification to deal with single-day diary data. The double-hurdle model is also the best specification to identify the factors that affect the decision to participate, and the level of participation, in leisure activities such as computer and internet use at home and outdoor recreation. For this reason and because of the rationale outlined in Section 8.3.3, the double-hurdle model was deemed the most appropriate for use in this analysis. The fundamental assumption of the Cragg and Duan models, as applied in this case, is that the parameters of the determinants of the participation decision and the level of participation decision are not restricted to be the same for both decisions. For example, being married may affect the participation decision in one way (increasing the likelihood of

participation) and may affect the hours decision another way (reducing the number of hours). The first part of the double-hurdle model consists of a probit model, predicting the likelihood of non-zero time use by an individual (participation). The second part of the model is a continuous regression model (OLS), applied only to the subsample with participants, to estimate the amount of time spent on voluntary activities (time use). Finally, an OLS model was used on all 491 observations and the differences in results between the double-hurdle and the straight OLS models are discussed.

Before running the double-hurdle and OLS models, frequencies and means were computed to obtain descriptive information on the sample. Cross-tabulations and various appropriate tests of significance were used to check for the existence of relationships between variables. Significance values are reported at $p<0.1$, $p<0.05$ and $p<0.01$. As discussed in Section 3.5, time use data consists of both continuous and discrete (exact zeros) values, is non-negative, generally right skewed and distributions of time data contain many zeros. Because of the exact zeros (and often because the data is highly positively skewed), the normality assumption is violated. For this reason, the non-parametric Mann-Whitney *U* test is preferable to the independent samples t-test and the Kruskal-Wallis test is preferable to one-way independent-measures Analysis of Variance (ANOVA).

9.4 Variables

The process of categorising activities as leisure is problematic as the boundaries between some categories can be indistinct. Categorising a specific activity imposes a universalistic definition: it defines the activity for everybody in all circumstances and does not take the individual into account. There are many activities, such as gardening, ironing, sports, knitting, or reading which might be considered as leisure activities for some people, but work for others. This suggests that no categorisation of activities can be altogether correct because of individual differences in attitudes towards specific activities. For the purpose of this study, leisure activities are organised into three categories: outdoor leisure (consists mostly of active leisure activities), passive leisure and social entertainment. The outdoor leisure category includes playing sports, physical exercise, productive exercise, attending sports related activities, computer, internet for personal use, hobbies and other leisure activities. Passive

leisure includes watching television, listening to the radio and reading. Finally, social entertainment includes spending time or chatting with family, friends or neighbours, visiting family and friends, eating or going out, and so on.

Thus, the dependent variables are the daily participation rate in outdoor leisure activities, passive leisure and social entertainment activities and the average daily time spent on outdoor leisure activities, passive leisure and social entertainment activities by those that participate. Total leisure was also included in the analysis as a dependent variable, though nearly all respondents reported doing some form of leisure activity during the diary day. Thus, the analysis did not reveal any substantive findings. For this reason, the total leisure variable is omitted from the analysis and the results are not reported. The independent variables considered are intended to encompass the determinants of participation and level of participation decisions and their choice rests on suggestions taken from the empirical literature reviewed in Section 9.2. As there has been no previous research on the determinants of the daily participation and time use decisions of the Irish population or any sub-group of the population, the choice of potential predictor variables does not rest on any a priori theory relating to Ireland. Thus, some predictor variables are unique to the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey* data. In this study, the role of individual, economic, household and farm characteristics, as well as time constraints in the participation and time allocation decisions of farm household members, are examined.

The individual characteristic predictor variables include level of education, age, gender, marital status, children and religiosity. Two economic variables were used, employment status and total household income. For this study, the relationship between various household and farm characteristics and leisure time are of special interest. It is speculated that individuals residing in households located further away from the nearest village or town will be less likely to participate and have less time available for outdoor leisure activities. People living in more populated villages or towns may allocate more time to leisure activities as they may have more access to social opportunities or there may be a larger choice of leisure activities from which to choose. Based on the conceptual framework of household production theory (Section 2.2), increased demands on time for household production, market or farm work is likely to decrease the amount of time available for leisure. Farming is labour

intensive, requiring a significant time investment and, therefore, it is expected that being the main farm operator or having an off-farm job as well as working on the farm will be inversely related to time allocated to leisure activities. An increase in hours in the labour market reduces time available for other activities, thus working more hours, either on or off the farm, is expected to have a negative effect on time allocated to leisure activities.

Including a variable denoting a situation where the respondent felt rushed or stressed during the diary day permits a better understanding of whether time constraints have an effect on leisure time. It is speculated that a rushed day will decrease participation in and time allocated to all leisure activities. Other factors that may affect participation and time spent on leisure are the season and the timing of the diary day (weekend vs. weekday). Variation in the seasons is particularly evident in Ireland and with regard to outdoor active leisure activities, as longer hours of daylight and better weather during the summer months provides more possibilities for participating in a wider variety of activities and for longer periods of time. The size of community variable was dichotomised (community of greater than or equal to 500 people or less than 500 people) because of the small numbers in certain categories. Self-rated health and quality of life were also transformed into binary variables equalling 1 if respondents reported fair, poor or very poor health or quality of life and 0 if respondents reported good or very good health or quality of life. Table 9.1 that follows presents a detailed description of the construction of the dependent and independent variables used in the subsequent analysis.

Table 9-1 Description of Dependent Variables and Covariates

	Covariates	Description
Dependent Variables	Daily Participation - Outdoor Leisure	Dummy = 1, if observed time spent doing sports, exercise or leisure activities > 0, otherwise = 0
	Daily Participation - Passive Leisure	Dummy = 1, if observed time spent watching TV, listening to the radio or reading during diary day> 0, otherwise = 0
	Daily Participation - Social Entertainment	Dummy = 1, if observed time spent socialising, communicating or going out > 0, otherwise = 0
	Daily Time Spent by Participants - Outdoor Leisure	Observed time spent doing sports, exercise or leisure activities during diary day, min/day, when participating dummy = 1
	Daily Time Spent by Participants - Passive Leisure	Observed time spent watching TV, listening to the radio or reading during diary day, min/day, when participating dummy = 1
	Daily Time Spent by Participants - Social Entertainment	Observed time spent socialising, communicating or going out during diary day, min/day, when participating dummy = 1
Individual Characteristics	Level of Education	Categorical variable with five bands indicating the highest level of education the respondent has completed. (1) Primary, (2) Junior Certificate, (3) Leaving Certificate (or equivalent), (4) Post-Leaving Certificate/Other, (5) Third Level.
	Age	A categorical variable with three bands indicating whether the respondent falls into age category (1) 19-40yrs, (2) 41-60yrs, or (3) 61+ yrs.category.
	Gender	Binary variable (0) Male (1) Female.
	Marital Status	Binary variable indicating whether the respondent is married or has a partner (1) or is single, separated or widowed (0).
	Children	Binary variable indicating whether the respondent has children (1) or not (0).
	Religious Activity	A binary variable that indicates if the respondent reported doing any religious activity (1) in either the weekday or weekend day diary.
Economic Variables	Employment Status	A categorical variable with five bands describing the respondent's situation regarding employment: (1) Employed (not farming), (2) Self-employed (inc. full-time farming), (3) Employed & part-time farming, (4) Retired, (5) Unemployed, Homemaker or Student.
	Total Household Income	A categorical variable with five bands. Includes total household gross income from all sources.
Household & Farm Characteristics	Rurality	Distance to nearest village, town or urban centre in kilometers.
	Rootedness	A categorical variable with five bands indicating the length of time the family has been living/farming in the area or community. (1) 1-10 years (2) 11-20 years (3) 21-50 years (4) 51-100 years (5). Over 100 years.
	Size of Community	Binary variable indicating whether the respondent is living in a community/village of 500 people or less (0) or a village or town of greater than 500 people (1).
	Farm Size	Farm size in hectares.
Time Constraints	Farm Operator	Binary variable indicating whether the respondent is the main farm operator (1) or not (0).
	Off-Farm Job	Binary variable indicating whether the respondent works off the farm (1) or not (0).
	Off-Farm Job (hrs worked)	Categorical variable identifying all of those doing zero hours of off-farm work (0), between 1hrs & 31 hrs of off-farm work (1) and greater than 31 hrs of off-farm work (2).
	Farm Work (hrs worked per wk)	Categorical variable identifying the number of hours of farm work per week: (1) between 0 & 8hrs (2) between 9hrs & 17hrs (3) between 18hrs & 26hrs (4) between 27hrs & 35hrs (5) Greater than 36 hrs per week.
	Rushed	Binary variable indicating whether the respondent felt rushed during the diary day (1) or not (0).
Other Variables	Season	Categorical variable indicating the season in which the diary was filled out: (1) Winter, (2) Spring, (3) Summer, or (4) Autumn.
	Weekday	Binary variable indicating whether the diary was completed on a weekday (0) or a weekend day (1)

9.5 Results

9.5.1 Bivariate Analysis

Before running the double-hurdle models, cross-tabulations, Mann-Whitney *U* tests and Kruskal-Wallis tests were used to evaluate the relationship between the participation in and the time allocated to outdoor leisure activities, passive leisure, social entertainment and a variety of individual, economic, farm and household characteristics as well as time constraints. Table 9-2 presents the results of the cross-tabulations. The daily participation rate in outdoor leisure activities is 35.8%, implying that the average annual number of outdoor leisure participation days is 131. Just over 80% of respondents participated in passive leisure activities. This equates to passive activities such as watching television, listening to the radio or reading being done on 295 days of the year. 32.9% of farm household members partake in social entertainment activities, implying that the average annual number of participation days is 120 days. The average daily time spent by the population doing outdoor leisure activities is 42 minutes. Average time allocated to social entertainment was 88.4 minutes per day. It is interesting to note that time allocated to passive leisure (128.6 minutes/day) was the highest among the three categories of leisure.

The bivariate analysis in Table 9-2 shows an association between participation in outdoor leisure activities and income, gender, hours spent working off the farm per week, feeling rushed, and day of the week. More specifically, the analysis shows that farm household members residing in households with an income of between €10,000 and €29,999 are more likely to participate in outdoor leisure activities. The analysis also shows that females are significantly more likely to participate in outdoor leisure activities than males. Respondents who allocate between 1 and 31 hours per week to their off-farm job are significantly more likely to participate in outdoor leisure activities. Not feeling rushed is also significantly associated with participating in active leisure activities. Finally, respondents are significantly more likely to participate in outdoor and active leisure activities on weekend days than weekdays. Gender, religiosity, hours allocated to off-farm work per week, feeling rushed and day of the week are significantly associated with level of participation in outdoor leisure activities. Females, those who participate in religious activities and respondents who do not

feel rushed allocate significantly more time to outdoor leisure activities. Farm household members who allocate between 1 and 31 hours per week to working off the farm spend significantly more time on outdoor leisure activities than those who allocate zero hours to off-farm work. Not surprisingly, respondents allocate significantly more time to outdoor leisure activities on weekend days compared to weekdays.

Level of education, age, children, hours allocated to working off the farm, feeling rushed and day of the week are associated with participation in passive leisure activities (Table 9-2). As expected, level of education is inversely related to participation in passive leisure activities. There is also a significant and positive association between age and participation in passive leisure activities. Respondents with children, those working between 1 and 31 hours per week off the farm and those who do not feel stressed are significantly more likely to participate in passive leisure activities. Farm household members are less likely to watch television, read or listen to the radio on weekend days compared to weekdays. Level of education, employment status, children, hours worked off the farm per week, feeling rushed and season are associated with the level of participation in passive leisure activities. Level of education and participation in passive leisure activities are inversely related. Farm household members who are unemployed, homemaking or students allocate the most amount of time to passive leisure activities. Older respondents also allocate significantly more time to watching television, reading and listening to the radio. Consistent with expectations, respondents allocate more time to passive leisure activities during the months of autumn and winter compared to spring and summer.

Participation in social entertainment activities is associated with level of education, employment status, religiosity, having an off-farm job, hours worked in an off-farm job per week, feeling rushed or stressed and day of the week. A curvilinear relationship exists between level of education and participation in social entertainment activities. Respondents with the lowest and highest levels of education are more likely to participate in social entertainment activities than respondents with any other level of education. Farm household members who are retired are also more likely to participate in social entertainment activities than respondent's with any other employment status. Consistent with the employment status finding, having an off-farm job is significantly and negatively associated with participation in

social entertainment activities. Thus, there is a significant and inverse relationship between the number of hours worked in an off-farm job and the participation in social entertainment activities. Those who do not feel rushed or stressed and those who participate in religious activities are significantly more likely to participate in social entertainment activities. As expected a priori, weekend days also significantly increase the likelihood of participation in social entertainment activities. Level of participation in entertainment activities is significantly associated with level of education, religiosity, having an off-farm job, feeling rushed and day of the week. Consistent with the finding for participation, a curvilinear relationship also exists between level of education and level of participation in social entertainment activities. Being involved in religious activities significantly increases the likelihood of participation in social entertainment activities. As expected, farm household members who do not have an off-farm job allocate significantly more time to social entertainment activities compared to those who do work off-the farm. Feeling rushed or stressed decreases the time spent in social entertainment activities and as one would expect, more time is allocated to social entertainment activities on weekend days compared to weekdays.

Table 9-2 Daily Participation Rates and Average Time Allocated to Outdoor Leisure, Passive Leisure and Social Entertainment Activities

	Outdoor Leisure Activities				Passive Leisure Activities				Social Entertainment Activities			
	Daily Participation Rate (% /day)		Daily Time Spent Population (mn/day)		Daily Participation Rate (% /day)		Daily Time Spent Population (mn/day)		Daily Participation Rate (% /day)		Daily Time Spent Population (mn/day)	
All	35.8		41.9		80.8		128.4		62.9		88.4	
Total Income												
0-€9,999	**24.8**	**	30.7	ns	80.0	ns	124.1	ns	66.7	ns	93.7	ns
€10,000-€29,999	**43.8**	**	42.3	ns	77.5	ns	128.1	ns	59.4	ns	88.7	ns
€30,000-€49,999	**36.7**	**	46.5	ns	83.3	ns	137.5	ns	53.3	ns	71.0	ns
€50,000-€69,999	**36.5**	**	45.2	ns	82.4	ns	143.7	ns	70.3	ns	96.3	ns
> €70,000	**32.1**	**	39.4	ns	82.1	ns	101.9	ns	66.7	ns	90.6	ns
p	**0.033**		0.292		0.793		0.194		0.128		0.179	
Education:												
Primary or Less	30.3	ns	32.9	ns	**88.2**	***	**152.1**	***	**70.6**	*	**84.64**	**
Group/Inter/Junior Cert	33.1	ns	37.9	ns	**86.5**	***	**133.4**	***	**63.9**	*	**77.45**	**
Leaving Cert	39.2	ns	47.3	ns	**71.2**	***	**122.5**	***	**53.6**	*	**90.68**	**
Post Leaving Cert/Diploma	37.3	ns	48.0	ns	**76.0**	***	**107.0**	***	**60.0**	*	**121.6**	**
Third Level Degree or Higher	46.8	ns	54.0	ns	**79.0**	***	**112.5**	***	**67.7**	*	**98.81**	**
p	0.206		0.342		**0.004**		**0.008**		**0.072**		**0.019**	
Employment Status:												
Employed (not farming)	37.1	ns	38.6	ns	80.0	ns	**108.4**	**	**60.0**	**	141.1	ns
Self-employed (inc. full-time farmers)	31.3	ns	34.6	ns	81.8	ns	**130.7**	**	**60.3**	**	128.5	ns
Employed & Part-Time Farming	33.6	ns	46.6	ns	78.2	ns	**115.6**	**	**57.3**	**	158.3	ns
Retired	39.1	ns	48.3	ns	87.0	ns	**151.3**	**	**84.8**	**	143.5	ns
Unemployed/Homemaker/Student	47.5	ns	54.6	ns	78.8	ns	**143.8**	**	**67.5**	**	146.4	ns
p	0.128		0.249		0.739		**0.047**		**0.014**		0.245	
Age:												
19-40 yrs	39.3	ns	60.5	ns	**64.3**	***	**87.1**	***	53.6	ns	102.3	ns
41-60 yrs	36.8	ns	42.4	ns	**82.1**	***	**121.9**	***	61.5	ns	86	ns
61+ yrs	33.9	ns	35.0	ns	**83.9**	***	**153.4**	***	68.5	ns	88	ns
p	0.753		0.526		**0.004**		**0.000**		0.102		0.659	
Gender												
Male	**30.0**	***	**38.8**	***	80.5	ns	125.3	ns	63.3	ns	90.9	ns
Female	**46.9**	***	**48.1**	***	81.4	ns	134.2	ns	62.2	ns	83.5	ns
p	**0.000**		**0.001**		0.807		0.460		0.802		0.559	
Marital Status:												
Separated/ Single/Widowed	32.1	ns	39.4	ns	78.6	ns	137.3	ns	66.4	ns	94.6	ns
Married/Partner	37.0	ns	42.8	ns	81.5	ns	125.3	ns	61.7	ns	86.3	ns
p	0.306		0.350		0.472		0.282		0.334		0.440	
Children												
No	37.9	ns	47.2	ns	**75.8**	*	**0.8**	*	68.2	ns	95.2	ns
Yes	35.1	ns	40.2	ns	**82.5**	*	**0.8**	*	61.1	ns	86.1	ns
p	0.558		0.588		**0.091**		**0.091**		0.145		0.414	
Religious Activity												
No	34.1	ns	**37.0**	*	81.0	ns	125.1	ns	**55.0**	***	**68.4**	***
Yes	53.0	ns	**54.1**	*	80.1	ns	136.2	ns	**82.1**	***	**137.3**	***
p	0.227		**0.065**		0.814		0.438		**0.000**		**0.000**	
Living in the Community												
1 – 10 years	30.8	ns	55.4	ns	69.2	ns	91.2	ns	38.5	ns	62.307	ns
11 – 20 years	28.6	ns	40.7	ns	71.4	ns	113.6	ns	71.4	ns	125.36	ns
21 – 50 years	43.9	ns	47.0	ns	80.3	ns	120.0	ns	65.2	ns	69.773	ns
51 – 100 years	30.1	ns	32.3	ns	80.8	ns	139.8	ns	67.1	ns	95.445	ns
100 + years	37.2	ns	44.0	ns	81.6	ns	125.9	ns	60.7	ns	87.726	ns
p	0.327		0.444		0.643		0.504		0.230		0.234	
Size of Community												
Village < 500 people	35.6	ns	47.5	ns	79.3	ns	130.0	ns	64.4	ns	87.4	ns
Village or Town of 500 people or more	35.8	ns	39.2	ns	81.5	ns	127.5	ns	62.1	ns	88.9	ns
p	0.332		0.595		0.549		0.834		0.620		0.906	

Off-Farm Job												
No	35.0	ns	39.4	ns	80.1	ns	132.4	ns	**68.3**	***	**92.8**	**
Yes	37.3	ns	46.0	ns	81.6	ns	122.9	ns	**55.2**	***	**81.9**	**
p	0.592		0.573		0.663		0.269		**0.002**		**0.043**	
Off-Farm Job (hrs worked per wk)												
0 hours	**36.1**	**	**39.5**	*	**80.3**	*	**137.7**	*	**68.1**	*	91.3	ns
Between 1 and 31 hrs	**47.1**	**	**51.7**	*	**89.7**	*	**146.4**	*	**55.2**	*	80.5	ns
Greater then 1 hrs	**30.3**	**	**40.6**	*	**77.4**	*	**108.9**	*	**60.0**	*	88.5	ns
p	**0.024**		**0.158**		**0.053**		**0.158**		**0.059**		0.289	
Farmwork (hrs worked per wk)												
0-8hrs	46.0	ns	45.9	ns	82.3	ns	127.4	ns	69.9	ns	111.1	ns
9-17hrs	33.8	ns	40.1	ns	77.9	ns	125.3	ns	57.4	ns	69.3	ns
18-26hrs	34.9	ns	51.6	ns	84.9	ns	147.3	ns	53.0	ns	71.1	ns
27-35hrs	33.0	ns	37.6	ns	80.2	ns	136.6	ns	64.8	ns	95.6	ns
> 36hrs	31.1	ns	37.6	ns	79.4	ns	118.4	ns	62.8	ns	84.2	ns
p	0.120		0.443		0.837		0.526		0.187		0.151	
Rushed												
No	**37.7**	**	**44.1**	**	**82.5**	**	**134.3**	***	**65.5**	***	**93.2**	***
Yes	**24.3**	**	**29.0**	**	**70.3**	**	**92.6**	***	**47.3**	***	**59.8**	***
p	**0.027**		**0.029**		**0.013**		**0.001**		**0.003**		**0.002**	
Season												
Winter	38.9	ns	44.5	ns	86.5	ns	**140.6**	**	66.7	ns	96.4	ns
Spring	41.6	ns	47.7	ns	84.2	ns	**130.4**	**	64.4	ns	82.7	ns
Summer	33.1	ns	43.5	ns	77.1	ns	**106.0**	**	55.9	ns	80.9	ns
Autumn	32.0	ns	35.7	ns	77.1	ns	**133.4**	**	64.0	ns	91	ns
p	0.323		0.432		0.116		**0.035**		0.334		0.260	
Weekend												
No	**31.8**	*	**24.8**	***	**84.7**	**	122.0	ns	**55.2**	***	**56.5**	***
Yes	**39.8**	*	**59.2**	***	**76.8**	**	134.7	ns	**70.7**	***	**120.6**	***
p	**0.058**		**0.001**		**0.023**		0.486		**0.000**		**0.000**	

Note. ns = not significant. Comparisons in bold are significantly different at * p<0.1, **p<0.05, and *** p<0.01

9.5.2 Double-Hurdle Models

The results of the double-hurdle models of time allocated to outdoor leisure, passive leisure and social entertainment are presented in Tables 9-3, 9-4 and 9-5. The first column presents the marginal effects for the probit selection equation and the coefficient estimates for the OLS regression are presented in the third column in each table. The dependent variable in the OLS model is the number of minutes, and thus the estimates are expressed in linear minutes. For both models, the standard errors and the robust standard errors are presented (columns two and four). The significance levels (based on a two-tailed test) are reported at $p<0.1$, $p<0.05$ and $p<0.1$. As the theory provides no unambiguous guidance in the choice of regressors to explain the participation and the time use decisions, the same set of variables were used in both stages for the three categories of leisure. Gender and farm operator were found to be highly correlated and therefore only gender was included in the models. The double-hurdle models show that the magnitudes and signs of the coefficients for factors affecting participation decisions differ from those for the factors affecting time use decisions

by participants. Furthermore, the models show that different factors affect the participation and time use decisions of participants in outdoor leisure, passive leisure and social entertainment.

Looking first at the participation decisions for outdoor leisure (Table 9-3), the key factors which influence participation include income, employment status, gender, children and feeling rushed or stressed. The estimated coefficients in the double-hurdle model show that there is a significant positive relationship between total household income and participation in outdoor leisure activities. That is to say, farm household members with total household incomes of greater than €10,000 are significantly more likely to participate in outdoor leisure activities. As income is highly correlated with level of education, it is not surprising that the findings for level of education are similar to those for income, though not significant. In line with expectations, respondents who are retired, unemployed, homemakers or students are significantly more likely to participate in outdoor or active leisure activities. The finding for employment status corroborates previous studies (Robinson and Godbey, 1997; Gershuny, 2005). Females are significantly more likely to participate in outdoor or active leisure activities than males. Having children significantly decreases the likelihood of participation in active leisure pursuits. Though not significant, there is a negative association between time allocated to farm work and participation in outdoor leisure activities. It can be argued that because farming is a physically demanding job, farm household members are more likely to participate in passive rather than active leisure activities after working on the farm. In line with expectations, feeling rushed or stressed is significantly and negatively associated with participation in outdoor leisure activities. That is to say, farm household members who feel rushed or stressed during the diary day are less likely to participate in outdoor leisure activities.

Turning to the time use decision, the key factors influencing the time allocated to outdoor or active leisure activities are income, age, distance from nearest village or town, size of community, hours worked on the farm per week and day of the week. While income is positively associated with participation in leisure activities, it is significantly and negatively associated with time allocated to leisure activities. It can be argued that while income affords the respondent the means to pursue a variety of leisure activities, the number of hours that

must be allocated to paid employment to increase income decreases the time that the respondent can allocate to leisure activities. Consistent with the findings of Dardis *et al.* (1994), age is found to be significantly and negatively related to time spent doing active leisure activities. This is most likely because as people get older, they participate more in passive leisure activities and less in outdoor or active leisure activities.

An interesting finding is that there is a significant and positive relationship between distance from nearest village or town and time allocated to outdoor or active leisure activities. It could be argued that respondents allocate more time to an activity if they travel a greater distance because they feel the need to get value for the time invested in travelling and the cost of travelling. Farm household members residing in communities of greater than 500 people spend significantly less time on outdoor or active leisure activities than those residing in communities of less than 500 people. This can be explained in part by the fact that people in smaller towns or cities have a greater sense of belonging to a community and a better knowledge of the activities available in their communities, thus increasing the time they allocate to such activities (Mueller, 1975; Putnam, 2000). An interesting pattern emerges in relation to number of hours worked on the farm and level of participation in outdoor or active leisure activities. Compared to farm household members who spend an average of between 0 and 8 hours on farm work per week, those who spend between 18 and 26 hours on farm work per week allocate significantly more time to outdoor or active leisure activities. There is a significant and positive relationship between weekend days and the number of hours allocated to outdoor or active leisure activities. This is most likely because people are free from the constraints of paid work on weekend days, and thus they will have a larger 'block' of free time to do more time consuming outdoor or active leisure activities. That is, with a number of hours of free time together, a broader range of activities is possible, such as taking a trip, going to a football match or going to the beach. These activities would be very difficult to squeeze into 45 minute blocks of free time on weekdays.

Looking next at participation in passive leisure activities, level of education, age, number of hours worked off the farm per week, feeling rushed or stressed and day of the week are associated with participation in passive leisure activities. In line with expectations and with previous research by Toivonen (2003) and Ruuskanen (2004), level of education is

significantly and negatively associated with participation in passive leisure activities, though the result is significant for Leaving Certificate level only. Higher levels of education decrease the likelihood of watching television, listening to the radio or reading. Unsurprisingly, there is a significant and positive relationship between age and participation in passive leisure activities and age and time allocated to passive leisure activities. Refuting the constraints side of the time allocation perspective, this analysis finds that hours spent on off-farm work per week are positively and significantly associated with participation in passive leisure activities. As expected a priori, feeling rushed or stressed is significantly and negatively related to the decision to participate in passive leisure activities and to the time allocation decision regarding passive leisure activities. Farm household members are significantly less likely to participate in passive leisure activities on weekend days than on weekdays but those who participate on weekend days allocate significantly more time to passive leisure activities. The decrease in the likelihood of participation in passive leisure activities on weekend days is most likely attributed to the same reasons why participation in active leisure activities increases on weekend days. Passive activities, such as watching television, reading and listening to the radio are readily available in the home, are relatively inexpensive, and can be done by those who have only a fifteen or thirty minute window in which to participate in the activity. Thus, passive leisure activities most likely fit weekday schedules as opposed to weekend day schedules.

Once participation has been estimated, it is possible to estimate the number of hours allocated to passive leisure activities. Level of income, employment status, age, distance from nearest village or town, feeling rushed or stressed and weekday are associated with level of participation. A curvilinear relationship exists between total household income and level of participation in passive leisure activities. Farm household members with the highest and lowest level of total household income are less likely to allocate time to passive leisure activities, while those in the middle income categories are more likely to allocate time to passive leisure activities. Hours allocated to watching television, listening to the radio or reading are significantly and positively related to being self-employed, unemployed, a homemaker or a student. The only category where time allocated to passive leisure activities is negatively associated with employment status is for those who are employed and part-time farming. Consistent with expectations, there is a significant and positive relationship between

distance from nearest village or town and time allocated to passive leisure activities. Living in a village or town with a population of 500 people or more has a small but insignificant effect on the participation decision but a significant and negative effect on the time allocated to passive leisure activities.

Finally, in terms of social entertainment activities, the key factors which influence participation include level of education, children, religiosity, rootedness, having an off-farm job, number of hours worked on the farm per week and feeling rushed or stressed. There is an inverse relationship between level of education and participation in social entertainment leisure activities, though the result is significant for those who have completed the leaving certificate only. The significant and negative relationship between having children and participation in social entertainment corroborates previous studies (Bryant and Zick, 2006; Lee and Bhargava, 2009). This is most likely because people who are married are more likely to have children and the literature has shown that people who are married have less time for leisure when compared to unmarried people (Robinson and Godbey, 1997; Thrane, 2000). A factor which has not been considered in relation to leisure activities in previous studies is religiosity. Religiosity has a significant and positive association with participation in and time allocated to social entertainment activities. This can be explained in part by the fact that religious ceremonies take place on Saturday evenings and respondents who attend religious activities may be likely to attend social entertainment leisure activities following the ceremonies.

Rootedness or length of residence in a community is positively associated with participation in social entertainment activities, though the result is significant for those farming or residing in their communities for between 21 and 50 years only. It can be argued that the longer an individual resides in a community, the more people they know and the more likely they are to be asked to attend social entertainment leisure activities. Consistent with the constraint side of the time allocation perspective, this analysis finds that having an off-farm job significantly decreases the likelihood of participating in social entertainment activities. Hours worked on the farm per week are also significant and inversely related to participation and level of participation in social entertainment activities. Consistent with the results from the other two

categories of leisure, feeling rushed also significantly decreases the likelihood of participation in social entertainment activities.

With regard to level of participation in social entertainment activities, income, level of education, age, religiosity, hours worked on the farm per week, seasonality and weekday are all associated with the decision to participate in social entertainment activities. There is a negative relationship between income and participation in social entertainment activities. Level of education is also negatively associated with participation in social entertainment activities. Age and time allocated to social entertainment activities are inversely related. Consistent with expectations, farm household members allocate less time to social entertainment activities during the months of spring, compared to during the winter. This is most likely because spring is one of the busiest times of the year on the farm for farm household members and thus constrains their time with regard to allocating time to activities off the farm. In line with expectations, farm household members are significantly more likely to allocate time to social entertainment activities on weekend days compared to weekdays.

Table 9-3 Results of Double-Hurdle Model for Outdoor or Active Leisure Activities

Independent Variable	Probit Margins Participation		OLS y > 0 condit.	
	dy/dx	Delta-Method Std. Error	min/day	Robust Std. Error
Total Income Ref: €0-€9,999				
€10,000-€29,999	**0.16 ****	**0.07**	**-49.05 ****	**22.23**
€30,000-€49,999	0.11	0.08	-33.82	31.13
€50,000-€69,999	0.07	0.08	-17.02	38.15
> €70,000	0.06	0.08	-20.87	29.40
Education Ref: Primary or Less				
Group/Inter/Junior Cert	0.05	0.07	-1.42	18.98
Leaving Cert	0.06	0.07	-0.47	21.50
Post Leaving Cert/Diploma	0.04	0.08	3.36	28.12
Third Level Degree or Higher	0.13	0.09	12.50	26.00
Employment Status Ref: Emoloyed (not farming)				
Self-employed (inc. full-time farmers)	0.12	0.09	-7.21	24.63
Employed & Part-Time Farming	0.10	0.08	-16.95	26.97
Retired	**0.23 ****	**0.11**	-7.03	30.20
Unemployed/Homemaker/Student	**0.17 ***	**0.10**	20.37	18.86
Age Ref: 19-40 yrs				
41-60 yrs	-0.02	0.08	-38.69	25.51
61+ yrs	-0.06	0.09	**-52.05 ***	**28.14**
Gender Ref: Male				
Female	**0.12 ***	**0.07**	-30.63	20.91
Marital Status Ref: Separated/Single/Widowed				
Married/Partner	0.09	0.07	-7.11	20.30
Children Ref: No				
Yes	**-0.12 ***	**0.07**	20.47	20.48
Religious Activity Ref: No				
Yes	0.01	0.05	6.63	14.73
Distance from nearest Village or Town (km)	0.00	0.01	**4.71 ****	**2.11**
Living in the Community Ref: 1 - 10 years				
11 – 20 years	-0.09	0.18	-55.08	78.91
21 – 50 years	0.11	0.15	-78.64	77.98
51 – 100 years	0.00	0.14	-76.24	76.46
100 + years	0.10	0.14	-71.86	77.81
Size of Community Ref: Village < 500 people				
Village or Town of 500 people or more	0.03	0.05	**-29.23 ****	**14.34**
Size of Farm (ha)	0.00	0.00	-0.08	0.28
Off-Farm Job Ref: No				
Yes	0.04	0.10	13.28	28.75
Off-Farm Job (hrs worked per wk) Ref: 0 hrs				
Between 1 & 31hrs	0.04	0.11	-8.67	31.21
Greater than 31hrs	-0.08	0.07	6.42	24.11
Farmwork (hrs worked per wk) Ref: 0-8 hrs				
9-17hrs	-0.11	0.08	4.93	22.78
18-26hrs	-0.07	0.10	**44.21 ****	**22.01**
27-35hrs	-0.10	0.09	19.93	27.24
> 36hrs	-0.09	0.09	36.05	25.16
Rushed Ref: No				
Yes	**-0.13 ****	**0.06**	6.52	18.28
Season Ref: Winter				
Spring	0.06	0.07	-1.60	16.54
Summer	-0.08	0.07	18.59	19.42
Autumn	-0.09	0.06	-8.53	16.87
Weekend Ref: No				
Yes	0.06	0.04	**60.78 *****	**14.11**
Constant	-1.139 *	0.06	190.516 *	101.58
Observations	491		176	
Model Pseudo R-squared/ R-squared	0.0882		0.3958	
Log Liklihood	-292.135			

Asterisks indicate levels of significance: * p<0.1, **p<0.05, and *** p<0.01

Table 9-4 Results of Double-Hurdle Model for Passive Leisure Activities

Independent Variable	Probit Margins Participation		OLS y > 0 condit.	
	dy/dx	Delta-Method Std. Error	min/day	Robust Std. Error
Total Income Ref: €0-€9,999				
€10,000-€29,999	-0.06	0.06	-1.25	13.36
€30,000-€49,999	0.02	0.07	10.38	17.27
€50,000-€69,999	0.05	0.06	**34.85 ** **	**17.21**
> €70,000	0.05	0.06	-10.08	15.21
Education Ref: Primary or Less				
Group/Inter/Junior Cert	-0.03	0.05	-1.71	13.42
Leaving Cert	**-0.17 *** **	**0.06**	13.89	15.16
Post Leaving Cert/Diploma	-0.10	0.07	-8.62	15.01
Third Level Degree or Higher	-0.07	0.07	-9.62	20.19
Employment Status Ref: Emoloyed (not farming)				
Self-employed (inc. full-time farmers)	0.08	0.08	**40.20 ** **	**19.86**
Employed & Part-Time Farming	-0.05	0.09	-4.09	17.90
Retired	0.09	0.10	21.99	23.41
Unemployed/Homemaker/Student	0.08	0.09	**42.38 ** **	**20.14**
Age Ref: 19-40 yrs				
41-60 yrs	**0.24 *** **	**0.08**	**42.15 ** **	**15.86**
61+ yrs	**0.24 ** **	**0.09**	**74.32 *** **	**19.69**
Gender Ref: Male				
Female	-0.04	0.06	8.90	14.46
Marital Status Ref: Separated/Single/Widowed				
Married/Partner	0.01	0.06	-17.39	15.05
Children Ref: No				
Yes	0.06	0.06	-3.16	15.05
Religious Activity Ref: No				
Yes	-0.01	0.04	-19.59	12.94
Distance from nearest Village or Town (km)	0.01	0.01	**3.99 *** **	**1.26**
Living in the Community Ref: 1 - 10 years				
11 – 20 years	-0.18	0.16	46.69	37.84
21 – 50 years	-0.02	0.11	-2.18	33.50
51 – 100 years	-0.08	0.10	9.29	32.81
100 + years	-0.03	0.10	-6.94	31.33
Size of Community Ref: Village < 500 people				
Village or Town of 500 people or more	-0.00	0.04	**-23.25 ** **	**10.67**
Size of Farm (ha)	0.00	0.00	-0.22	0.18
Off-Farm Job Ref: No				
Yes	-0.00	0.08	28.56	18.94
Off-Farm Job (hrs worked per wk) Ref: 0 hrs				
Between 1 & 31hrs	**0.15 ** **	**0.06**	-0.36	20.61
Greater than 31hrs	0.03	0.06	-7.91	15.71
Farmwork (hrs worked per wk) Ref: 0-8 hrs				
9-17hrs	-0.01	0.06	16.36	16.07
18-26hrs	0.06	0.06	18.44	20.26
27-35hrs	-0.07	0.07	8.20	15.91
> 36hrs	-0.09	0.07	-7.13	15.49
Rushed Ref: No				
Yes	**-0.10 ** **	**0.05**	**-35.87 *** **	**11.90**
Season Ref: Winter				
Spring	0.01	0.05	-7.89	13.46
Summer	-0.09	0.06	-6.95	13.13
Autumn	-0.03	0.05	18.32	12.19
Weekend Ref: No				
Yes	**-0.07 ** **	**0.04**	**38.26 *** **	**10.55**
Constant	0.542	0.72	71.20	47.10
Observations	491		394	
Model Pseudo R-squared/ R-squared	0.1396		0.2295	
Log Liklihood	-209.970			

Asterisks indicate levels of significance: * p<0.1, **p<0.05, and *** p<0.01

Table 9-5 Results of Double-Hurdle Model for Social Entertainment Activities

Independent Variable	Probit Margins Participation		OLS y > 0 condit.	
	dy/dx	Delta-Method Std. Error	min/day	Robust Std. Error
Total Income Ref: €0-€9,999				
€10,000-€29,999	0.00	0.07	**29.43 ***	**15.85**
€30,000-€49,999	-0.04	0.08	-22.58	19.27
€50,000-€69,999	0.06	0.08	-12.89	17.89
> €70,000	0.08	0.08	-15.20	21.01
Education Ref: Primary or Less				
Group/Inter/Junior Cert	0.01	0.06	9.75	17.21
Leaving Cert	**-0.16 ****	**0.07**	**-32.48 ***	**17.35**
Post Leaving Cert/Diploma	-0.03	0.08	-25.44	21.03
Third Level Degree or Higher	-0.05	0.09	-26.45	21.60
Employment Status Ref: Emoloyed (not farming)				
Self-employed (inc. full-time farmers)	-0.14	0.09	-42.72	28.08
Employed & Part-Time Farming	0.00	0.09	-0.70	22.83
Retired	0.07	0.10	-25.44	31.39
Unemployed/Homemaker/Student	-0.06	0.10	-31.48	31.32
Age Ref: 19-40 yrs				
41-60 yrs	0.01	0.08	**-112.20 ****	**24.92**
61+ yrs	0.01	0.10	**-138.20 ****	**27.27**
Gender Ref: Male				
Female	-0.07	0.07	-19.40	15.31
Marital Status Ref: Separated/Single/Widowed				
Married/Partner	0.04	0.07	-13.42	17.31
Children Ref: No				
Yes	**-0.13 ***	**0.07**	17.11	19.67
Religious Activity Ref: No				
Yes	**0.26 ****	**0.05**	**32.02 ****	**13.36**
Distance from nearest Village or Town (km)	-0.01	0.01	-1.28	1.49
Living in the Community Ref: 1 - 10 years				
11 – 20 years	0.23	0.20	54.74	60.98
21 – 50 years	**0.26 ***	**0.15**	-29.60	58.27
51 – 100 years	0.23	0.15	20.14	57.28
100 + years	0.22	0.14	17.35	56.69
Size of Community Ref: Village < 500 people				
Village or Town of 500 people or more	0.01	0.05	14.85	13.25
Size of Farm (ha)	0.00	0.00	-0.20	0.27
Off-Farm Job Ref: No				
Yes	**-0.20 ****	**0.10**	-39.25	30.10
Off-Farm Job (hrs worked per wk) Ref: 0 hrs				
Between 1 & 31hrs	0.03	0.09	14.58	24.98
Greater than 31hrs	0.03	0.07	-0.98	16.74
Farmwork (hrs worked per wk) Ref: 0-8 hrs				
9-17hrs	**-0.16 ****	**0.08**	**-52.22 ****	**21.07**
18-26hrs	**-0.22 *****	**0.09**	-32.00	25.23
27-35hrs	-0.10	0.08	-18.40	20.87
> 36hrs	**-0.14 ***	**0.08**	-34.89	23.96
Rushed Ref: No				
Yes	**-0.11 ***	**0.06**	3.5544	16.42
Season Ref: Winter				
Spring	-0.00	0.07	**-28.38 ***	**15.90**
Summer	-0.06	0.07	-2.10	17.28
Autumn	0.03	0.06	-6.05	14.98
Weekend Ref: No				
Yes	0.04	0.05	**52.14 *****	**12.02**
Constant	0.5999	0.64	286.852 ***	74.36
Observations	491		308	
Model Pseudo R-squared/ R-squared	0.1427		0.2932	
Log Liklihood	-277.992			

Asterisks indicate levels of significance: * p<0.1, **p<0.05, and *** p<0.01

9.5.3 Ordinary Least Square Models

As indicated in Section 8.5.4, Gershuny (2012) suggests that a more directly controllable OLS regression approach rather than the mixed modelling double-hurdle approach used in Section 9.5.2 could produce more robust results. Tables 9.6, 9.7 and 9.8 provide the coefficient estimates of the OLS regressions for the level of participation in outdoor or active leisure activities, passive leisure activities and social entertainment activities. The dependent variable in the OLS model is the number of minutes, thus, the estimates are expressed in linear minutes. For each model, the robust standard errors are presented.

In terms of outdoor or active leisure activities (Table 9-6), the key factors that influence the level of participation are employment status, weekday and whether the respondent felt rushed during the diary day. Compared to being employed and not farming, farm household members who are retired, unemployed, a homemaker or a student allocate significantly more time to outdoor or active leisure activities. As one would expect, farm household members who felt rushed during the diary day allocated less time to outdoor or active leisure activities while weekend days have a significant and positive impact on level of participation in outdoor or active leisure activities. These results are somewhat comparable to the results from the double-hurdle model though being retired has a negative impact on level of participation in the double-hurdle model but a positive impact on level of participation in the OLS model. Age, distance from nearest town or village, size of community and hours worked on the farm are not significant in the OLS model but are significantly related to level of participation in the double-hurdle model.

Turning to passive leisure activities (Table 9-7), the stand alone OLS model produces very similar results as the conditional OLS model in the double-hurdle model. Level of income, employment status, age, distance from nearest village or town, feeling rushed or stressed and weekday are associated with level of participation. A curvilinear relationship exists between total household income and level of participation in passive leisure activities. Farm household members with the highest and lowest level of total household income allocate less time to passive leisure activities, while those in the middle income categories allocate more time to passive leisure activities. Hours allocated to watching television, listening to the radio or

reading are significantly and positively related to being self-employed, employed and part-time farming, unemployed, a homemaker or a student. Consistent with expectations, there is a significant and positive relationship between distance from nearest village or town and time allocated to passive leisure activities. Living in a village or town with a population of 500 people has a significant and negative effect on the time allocated to passive leisure activities.

Looking next at participation levels in social entertainment activities, the OLS model reveals results that are broadly in line with those from the double-hurdle model. Level of education, employment status, age, gender, religiosity, number of years living in ones community, off-farm job, hours worked on the farm per week and weekday are all associated with the decision to participate in social entertainment activities. Level of education is also negatively associated with participation in social entertainment activities. There is a negative relationship between being self-employed and level of participation in social entertainment activities. Age and time allocated to social entertainment activities are inversely related. Being female significantly decreases level of participation in social entertainment activities. Compared to those living in their communities for between 1 and 10 years, farm household members who are living in their communities for between 11 and 20 years allocate less time to social entertainment activities. Consistent with expectations, more time allocated to farm work significantly decreases the level of participation in social entertainment activities. In line with expectations, farm household members allocate significantly more time to social entertainment activities on weekend days compared to weekdays.

Table 9-6 Results of OLS Model for Outdoor or Active Leisure Activities

Independent Variable	OLS	
	min/day	Robust Std. Error
Total Income Ref: €0-€9,999		
€10,000-€29,999	-0.12	9.45
€30,000-€49,999	5.22	14.64
€50,000-€69,999	4.34	13.58
> €70,000	4.53	12.99
Education Ref: Primary or Less		
Group/Inter/Junior Cert	7.50	10.17
Leaving Cert	14.52	12.50
Post Leaving Cert/Diploma	8.13	13.23
Third Level Degree or Higher	20.75	14.70
Employment Status Ref: Emoloyed (not farming)		
Self-employed (inc. full-time farmers)	9.31	14.57
Employed & Part-Time Farming	9.19	13.11
Retired	**32.11 ***	**16.64**
Unemployed/Homemaker/Student	**29.58 ****	**14.37**
Age Ref: 19-40 yrs		
41-60 yrs	-12.50	14.29
61+ yrs	-18.15	16.30
Gender Ref: Male		
Female	0.99	13.56
Marital Status Ref: Separated/Single/Widowed		
Married/Partner	15.09	10.22
Children Ref: No		
Yes	-16.08	10.98
Religious Activity Ref: No		
Yes	3.97	9.77
Distance from nearest Village or Town (km)	1.99	1.69
Living in the Community Ref: 1 - 10 years		
11 – 20 years	-16.60	42.93
21 – 50 years	-9.32	39.86
51 – 100 years	-21.50	39.87
100 + years	-5.14	38.98
Size of Community Ref: Village < 500 people		
Village or Town of 500 people or more	-9.89	7.55
Size of Farm (ha)	0.18	0.14
Off-Farm Job Ref: No		
Yes	6.81	15.22
Off-Farm Job (hrs worked per wk) Ref: 0 hrs		
Between 1 & 31hrs	2.20	14.57
Greater than 31hrs	-7.04	11.61
Farmwork (hrs worked per wk) Ref: 0-8 hrs		
9-17hrs	-5.10	13.03
18-26hrs	13.65	15.90
27-35hrs	2.40	13.48
> 36hrs	2.77	14.23
Rushed Ref: No		
Yes	**-16.62 ****	**8.11**
Season Ref: Winter		
Spring	9.15	10.02
Summer	2.39	11.45
Autumn	-12.06	9.11
Weekend Ref: No		
Yes	**27.97 *****	**7.51**
Constant	14.68	
Observations	491	
R-squared	0.1188	

Asterisks indicate levels of significance: * p<0.1, **p<0.05, and *** p<0.01

Table 9-7 Results of OLS Model for Passive Leisure Activities

Independent Variable	OLS	
	min/day	Robust Std. Error
Total Income Ref: €0-€9,999		
€10,000-€29,999	-10.09	13.79
€30,000-€49,999	7.90	17.04
€50,000-€69,999	**33.58 ***	**17.84**
> €70,000	-1.88	16.07
Education Ref: Primary or Less		
Group/Inter/Junior Cert	-6.91	13.64
Leaving Cert	-18.97	15.62
Post Leaving Cert/Diploma	-25.02	16.49
Third Level Degree or Higher	-19.72	19.90
Employment Status Ref: Emoloyed (not farming)		
Self-employed (inc. full-time farmers)	**41.15 ****	**19.73**
Employed & Part-Time Farming	-7.50	18.31
Retired	28.24	24.24
Unemployed/Homemaker/Student	**43.13 ****	**20.86**
Age Ref: 19-40 yrs		
41-60 yrs	**55.26 *****	**15.82**
61+ yrs	**82.13 *****	**20.39**
Gender Ref: Male		
Female	4.41	14.03
Marital Status Ref: Separated/Single/Widowed		
Married/Partner	-13.74	15.41
Children Ref: No		
Yes	8.25	15.14
Religious Activity Ref: No		
Yes	-14.96	13.16
Distance from nearest Village or Town (km)	**4.33 *****	**1.23**
Living in the Community Ref: 1 - 10 years		
11 – 20 years	1.89	35.68
21 – 50 years	-20.20	26.66
51 – 100 years	-16.65	25.64
100 + years	-24.71	23.57
Size of Community Ref: Village < 500 people		
Village or Town of 500 people or more	**-15.96 ****	**10.77**
Size of Farm (ha)	-0.06	0.18
Off-Farm Job Ref: No		
Yes	23.15	20.00
Off-Farm Job (hrs worked per wk) Ref: 0 hrs		
Between 1 & 31hrs	25.02	20.89
Greater than 31hrs	-4.19	15.91
Farmwork (hrs worked per wk) Ref: 0-8 hrs		
9-17hrs	14.77	17.46
18-26hrs	25.28	20.64
27-35hrs	-4.37	16.76
> 36hrs	-18.21	16.78
Rushed Ref: No		
Yes	**-45.45 *****	**11.94**
Season Ref: Winter		
Spring	-6.41	13.39
Summer	**-26.68 ****	**13.60**
Autumn	9.05	12.92
Weekend Ref: No		
Yes	**19.68 ***	**10.84**
Constant	62.16	
Observations	491	
R-squared	0.1864	

Asterisks indicate levels of significance: * p<0.1, **p<0.05, and *** p<0.01

Table 9-8 Results of OLS Model for Social Entertainment Activities

Independent Variable	OLS	
	min/day	Robust Std. Error
Total Income Ref: €0-€9,999		
€10,000-€29,999	19.32	13.29
€30,000-€49,999	-11.28	15.69
€50,000-€69,999	7.25	15.57
> €70,000	7.35	16.38
Education Ref: Primary or Less		
Group/Inter/Junior Cert	4.09	15.02
Leaving Cert	**-43.38 *** **	**13.30**
Post Leaving Cert/Diploma	-16.68	16.43
Third Level Degree or Higher	-21.59	19.36
Employment Status Ref: Emoloyed (not farming)		
Self-employed (inc. full-time farmers)	**-47.41 ** **	**20.62**
Employed & Part-Time Farming	2.69	19.62
Retired	-7.77	23.74
Unemployed/Homemaker/Student	-15.96	23.04
Age Ref: 19-40 yrs		
41-60 yrs	**-54.30 *** **	**19.02**
61+ yrs	**-72.05 *** **	**21.10**
Gender Ref: Male		
Female	**-33.75 *** **	**12.67**
Marital Status Ref: Separated/Single/Widowed		
Married/Partner	-3.16	13.08
Children Ref: No		
Yes	-7.13	14.60
Religious Activity Ref: No		
Yes	**56.64 *** **	**12.27**
Distance from nearest Village or Town (km)	-1.28	1.11
Living in the Community Ref: 1 - 10 years		
11 – 20 years	**73.88 ***	**42.88**
21 – 50 years	27.18	34.54
51 – 100 years	49.20	33.95
100 + years	51.06	33.03
Size of Community Ref: Village < 500 people		
Village or Town of 500 people or more	9.38	10.84
Size of Farm (ha)	-0.01	0.20
Off-Farm Job Ref: No		
Yes	**-49.43 ** **	**21.59**
Off-Farm Job (hrs worked per wk) Ref: 0 hrs		
Between 1 & 31hrs	5.56	20.09
Greater than 31hrs	-1.22	15.20
Farmwork (hrs worked per wk) Ref: 0-8 hrs		
9-17hrs	**-65.52 *** **	**18.47**
18-26hrs	**-64.53 *** **	**20.42**
27-35hrs	-32.06	19.65
> 36hrs	**-48.19 ** **	**20.21**
Rushed Ref: No		
Yes	-16.42	11.57
Season Ref: Winter		
Spring	-14.06	13.18
Summer	-8.51	13.55
Autumn	0.42	12.49
Weekend Ref: No		
Yes	**37.73 *** **	**9.79**
Constant	177.19	
Observations	491	
R-squared	0.2533	

Asterisks indicate levels of significance: * p<0.1, **p<0.05, and *** p<0.01

9.5.4 Summary of Results

In summary, the double-hurdle models reveal that participation in leisure activities is governed by two independent decisions, the decision to participate and the decision on how much time to allocate to each activity. After a respondent has decided to participate, the level of participation is determined by different factors. The estimation results also show that individual, economic, household and farm characteristics as well as constraints on time relate differently to participation and time investment decisions of farm household members and on occasion work in opposite directions. Day of the week is an example of the latter. Respondents are less likely to participate in passive leisure activities on weekend days, however for those who do participate, they allocate significantly more time to passive leisure activities on weekend days. Only a few variables identically affect both the participation and time use decisions. Moreover, the factors that effect the decision to participate in and the time to allocate to outdoor or active leisure, passive leisure and social entertainment are different for each category of leisure activity.

The results of this analysis indicate that only 36% of the farm household members surveyed participated in outdoor or active leisure activities on the diary days, while 81% were involved in some form of passive leisure activity and 63% partook in some form of social entertainment. The participation decision for outdoor leisure is mainly influenced by level of household income, employment status, gender, children and the feeling of being rushed or stressed, whereas the main determinants of time use are income, age, distance from nearest town or village, size of community, number of hours worked on the farm per week and day of the week. The decision to participate in passive leisure is guided by level of education, age, number of hours worked off the farm per week, the feeling of being rushed or stressed and day of the week. Level of income, employment status, age, ruraliy, size of community, the feeling of being rushed or stressed and day of the week affect the time that those who participate in passive leisure allocate to such. Finally, the decision to take part in social entertainment activities is associated with level of education, children, religiosity, rootedness, the occurrence of an off-farm job, hours worked on the farm per week and feeling rushed while income, level of education, age, religiosity, hours worked on the farm per week, season and day of the week affect the time allocated to social entertainment for those who participate.

The findings with regard to participation in active leisure activities are broadly in line with those from previous studies, though some interesting findings emerge from the analysis of the factors that affect the number of hours dedicated to active leisure activities. Farm household members who live further away from their nearest village or town allocate more time to active leisure activities than those who live closer to their nearest village or town. Farm household members residing in communities of greater than 500 people allocate less time to active leisure activities than those residing in communities of less than 500 people. Also of interest is the positive relationship between the number of hours allocated to farming and the number of hours allocated to active leisure activities. That is to say, farm household members living further from their local community but whose communities are small allocate more time to active leisure activities.

Similar to the findings for active leisure activities, the findings with regard to participation and level of participation in passive leisure activities are in general consistent with expectations. Older farm household members, those who are unemployed, self-employed, homemakers or students allocate significantly more time to passive leisure activities. Distance from nearest village or town increases the time allocated to passive leisure activities, while living in a larger village or town decreases the time allocated to passive leisure activities. One of the novel findings in this research is with regard to social entertainment activities. Religiosity has not been considered in relation to leisure activities in previous studies and the analysis in this chapter finds that religiosity is positively associated with participation and level of participation in social entertainment activities. Rootedness of length of time residing in a community is also positively associated with participation in social entertainment activities. Another novel though intuitive finding is that, for farm household members at least, the level of participation in social entertainment activities is highest in winter.

Across the three categories of leisure activities, feeling rushed or stressed significantly decreases the likelihood of participation, though these results should be interpreted with caution as there may be some bi-directionality in the relationship. For level of participation in active leisure, passive leisure and social entertainment activities, income, age and day of the week is a consistent predictor. The level of participation in the three categories of leisure

activities increases significantly on weekend days compared to weekdays. There is a positive relationship between age and level of participation in passive leisure activities but a negative relationship between age and level of participation in active leisure and social entertainment activities. Level of income also affects the level of participation in each category of leisure activity in a different direction. Level of income is negatively associated with level of participation in active leisure and social entertainment activities but there is a curvilinear relationship between level of income and level of participation in passive leisure activities.

9.6 Discussion

The analysis of time use diary data and the results presented in this chapter provide new information about the leisure time activities of farm household members in the West of Ireland. One of the main aims of this chapter was to address a gap in the literature by examining the determinants of daily participation in and the time allocated to leisure activities among farm household members in the West of Ireland. In line with this, the relationships between the participation and time use decisions across three categories of leisure activities were examined. The empirical results highlight the analytical advantages of distinguishing between the determinants of leisure participation and the determinants of time use decisions. The time use diary coupled with detailed individual and household background variables used in this analysis offers fruitful tools for diversified empirical modelling of leisure behaviours and collects baseline data for future research on the leisure activities of farm household members.

The findings of research such as this have broad ramifications for societal well-being. As outlined in Section 9.1, the availability of leisure time and participation in leisure activities is an important dimension of social well-being, positively affecting individual health and life satisfaction (Kelly *et al.*, 1987; Altergott and McCreedy, 1993; Dardis *et al.*, 1994; Riddick and Stewart, 1994). Relaxing and refreshing the body and mind through the participation in leisure activities can improve mental and physical health, as well as providing a sense of identity and personal anatomy (Jang, 1995). Improved health enhances earning power in the labour market and productivity in the household, thus increasing the total resources of the individual (Becker, 1965). Some leisure activities, through the prevention of social isolation

by the formation of community networks, play an important role in the quality of life of the aging population (Kelly and Ross, 1989; Mannell, 1999; Tinsley *et al.*, 2002). Given that 57% of the sample of farm household members are between the ages of 41 and 60 and 33% are over 60, identifying the extent of involvement in various categories of leisure activities and understanding the factors affecting time use for leisure activities provides valuable insights for policy makers concerned with the well-being of the individual, particularly farm household members.

A new finding to emerge from this research is that rurality or distance from nearest village or town has a positive effect on the time allocated to passive leisure activities. This is most likely because of poor accessibility to communities and other means of active leisure activities. Thus, leisure service planners, health policy executives and local authority representatives who aim to increase sociability and decrease participation in passive leisure activities should work towards increasing accessibility to community and social networks and thus prevent social isolation. This analysis also finds that individual, farm and household characteristics, economic variables, day of the week and time constraints contribute to differences in participation and time use in active leisure, passive leisure and social entertainment, but their effects and relative importance vary between category of leisure activity. In light of this, policy makers and interest groups who aim to inform or educate members of the population in relation to the benefits or adverse effects of certain leisure activities should be aware that the leisure activity they are interested in will most likely be influenced by factors different to those affecting participation or level of participation in other leisure activities.

Finally, the limitations of the analysis in this chapter should be discussed. Due to the cross-sectional nature of the data analysed, the estimated effects should once again be considered as associations as opposed to causal effects. Further econometric analysis is required in order to make inferences as to the causal effects of the individual, farm and household characteristics, economic variables, day of the week and time constraints on participation and level of participation in the various categories of leisure activity analyses in this chapter. As this is the first time that a time use study in Ireland has been used to measure the time allocated to leisure activities of farm household members, there is no data with which to compare these

results. However, one potential extension for future research is to utilize the data from the Irish National Time Use Survey conducted in 2005 (ESRI, 2005) and draw some comparisons between the participation and time use decisions of farm household members and members of the general population in leisure activities.

10. Summary and Conclusions

10.1 Introduction

This chapter presents a summary of this thesis and sets out some conclusions in relation to the limitations of the research, potential avenues for future research, as well as its policy implications. To begin, Section 10.2 contains a summary of the key issues and findings from each chapter as they relate to the overall research goals as stated in Chapter 1. Section 10.3 then discusses the limitations of the methodology in measuring and monitoring participation and levels of participation and the caveats in the subsequent analysis. Following this, Section 10.4 sets out the avenues for future research using the data that was collected in the single-purpose *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey*. Section 10.5 briefly discusses a number of policy related issues, while Section 10.6 sets out the concluding remarks. Finally Section 10.7 lists the outputs from the research undertaken for this thesis to date.

10.2 Summary of Thesis

This thesis analyses the typical patterns of time use of farm household members in the West of Ireland, focusing specifically on participation and level of participation in civic engagement, voluntary and leisure activities, as well as the factors that affect the well-being of farm household members. Within this context, Chapter 1 discusses the links between the family farm and the rural community in Ireland and the role that farming and therefore farm families play in the economic and social fabric of rural communities. It provides an overview of the agricultural sector in Ireland, outlining the challenges and uncertainties faced by farm household members due to the changing landscape of farming in Ireland and how these shape the behaviour and decision making patterns of household members. Furthermore, it highlights the need for the collection of time use and micro-level data on farm household members in Ireland, as a study providing an in-depth assessment of how farm household members organise their daily lives may serve to inform policy-makers on how to proceed with rural development issues.

Chapter 2 sets out the most appropriate theoretical framework from which to conceptualise the time allocation decisions of farm household members and the forces that affect these decisions. A review of the theories of the household shows that no particular approach is sufficiently advanced so as to dominate the field of household economics, though the case is made for accepting a variant of the unitary model as the theoretical model of decision-making in households to frame the analysis of time use of farm household members. The unitary model is important as it sets the scene for analysing the important trade-offs between time spent in different activities. Thus, the agricultural household model, based on the unitary model of household decision making with two members in the household, is specified. There is no bargaining between the household members and the decisions reached are efficient by definition making the model tractable even when farm household production is introduced into it. It is this theoretical framework that is used to empirically model how farm household members allocate their time throughout the thesis.

Given that one of the main aims of the thesis is to collect time use data on farm household members, Chapter 3 outlines the development of time use as a tool for research and describes the various instruments available for the collection of time use data. It finds that it is not possible to state unambiguously that one method is superior to another but that the time diary approach has proved the preference of most researchers. This is because time use diaries provide reliable information about activities that respondents do not necessarily have about themselves, are less susceptible to the failure of recall, and they provide very complex information in a very flexible way. Following this, it is concluded that the time use diary method with accompanying individual and household questionnaires is the most appropriate method of time use data collection for the purpose of this thesis. A summary of the potential applications of time use surveys is presented and gaps in the literature that merit further analysis are identified, including with respect to civic engagement, volunteering and leisure activities, as well as health and quality of life. Finally, this chapter reports the many challenges when attempting to analyse time use data using econometric methods and finds that the choice of the most appropriate approach is highly case specific and depends largely on the activity under consideration, the assumptions about the zero generating process and the specific objectives of the study.

A detailed discussion of the development and evolution of the survey instrument, including the lengthy process of research, design, testing, editing and finally administering the survey over a seventeen month period is presented in Chapter 4. This includes a summary of the specificities of the survey instrument, the options available for each design consideration and the justification for each design choice. It was deemed appropriate to restrict the data collection to four counties: Galway, Sligo, Mayo and Roscommon and that the diary, for the purpose of this research, would focus on the farm household, in particular the farm operator and one other household member. Following this, it was determined that the self-administered 'tomorrow' diary would be administered by means of the postal method. Pre-coded fixed time intervals of 15 minutes were chosen, while a list of thirty activity codes was assembled (following consultation with a focus group, pre-testing and pilot testing). Subsequently, it was established that secondary activity and contextual data would be collected for each individual. An overview of the questions contained in the individual and household questionnaires and the motivation for the inclusion of each question is also included in Chapter 4. Finally, the process of pre-testing and piloting the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey* and the changes that were made to the survey instrument before its final administration are discussed.

In Chapter 5, the sample descriptive statistics from the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey* are presented. The challenging process of preparing and organising the data for analysis is described. The summary information on the response rates reveals that a total of 282 eligible respondent booklets were returned from 191 households providing 520 diaries in total for analysis. It is noteworthy that the sample are an older sub-group of the population as the average age of respondents is 55, with 33% of respondents 60 years of age or over. Also worthy of note is that farm household members in the sample have lower levels of educational attainment compared to the national population. With regard to household level characteristics, a higher proportion (13%) of farm household members live on their own compared to the 2011 Census data, which reports that 8.5% of the population live alone. Also of interest is that 49.5% of the national population who live alone are male compared to 87% of farm household members. Most farm families have resided or farmed in their communities for fifty years or more (85%), suggesting that they are settled in their communities. Of particular interest is that on 49.5% of farm households either the farm

operator or the other survey respondent has an off-farm job, highlighting the reliance of farm households in the survey region on non-farm income. The analysis in this chapter suggests that the future of farming, in the survey area at least, is uncertain.

Chapter 6 presents an overview of the typical patterns of time use of farm household members in the West of Ireland and examines the trade-offs they are faced with. It gives new insight into how much time Irish farm household members spend on various activities and what they do with their free time. It also permits a better understanding of the role of gender in shaping daily time use and activity patterns and makes tentative comparisons between the time use of farm household members in the West of Ireland (as of 2011/12) and the time use of the general population in Ireland at the national level (as of 2005). This was done by accessing the micro-data from the Irish National Time Use Survey 2005 (ESRI, 2005) via the Irish Social Science Data Archive (ISSDA). Worthy of note is that a significantly larger proportion of farm household members care for adults when compared to the entire population. Furthermore, farm household members allocate more time to caring for adults then the general population. Looking at volunteering, farm household members are significantly more likely to participate than the average person in the population and they allocate significantly more time to volunteering. This chapter also reveals that a significantly higher proportion of farm household members in the West of Ireland chat and spend time with family, friends and neighbours compared to members of the general population. The analysis of the data across gender reveals that in general men living in farm households allocate significantly more time to farm related activities than women and women allocate significantly more time to housework and other household tasks, shopping, caring for others, religious activities, sports and exercise and reading than men.

Chapter 7 presents analysis of the role of socioeconomic, family, farm and community characteristics in shaping daily time use and activity patterns of farm household members in the West of Ireland. From this analysis it is concluded that there is a relationship between time allocated to voluntary activities, either formal or informal, having an off-farm job, the number of children the respondent has and farm size. The analysis in this chapter also infers that there are associations between active leisure, having an off-farm job, marital status, the number of children the respondent has, farm size and the size of community the respondent

farms and resides in. Passive leisure is shown to be correlated with age, level of education, having an off-farm job, marital status, having children and number of children, farm size, seasonality, distance from nearest village or town and rootedness or length of time residing in one's community. Finally, income, having an off-farm job, farm size, seasonality and rootedness are found to be associated with social entertainment activities. Since this is a baseline study, the results presented in this chapter can be utilised by future research that seeks to compare the allocation of time across socioeconomic groups or across time.

While Chapters 5 to 7 present sample descriptive statistics and a preliminary analysis of the data collected in the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey*, Chapters 8 and 9 present a more in-depth analysis of who is most likely to participate in civic engagement, voluntary and leisure activities and among participants, who is likely to devote substantial amounts of time to these activities. Within this contest, using logistic regression analysis and double-hurdle models, Chapter 8 contributes to the existing literature by examining the factors that influence farm household members' participation in informal voluntary activities. In line with expectations, the double-hurdle estimation reveals that participation in civic and voluntary activities is governed by two independent decisions: the decision to participate and the decision on the allocation of time. The estimation results also show that individual, economic, household and farm characteristics, as well as indicators of social capital, relate differently to the participation and time investment decisions of farm household members and sometimes have opposite effects.

The results from the analysis of the questionnaire data and the time diary data from the same sample of respondents highlight that, consistent with emerging literature, the determinants of volunteering are changing and in some cases are no longer consistent with traditional and seminal literature on the determinants of volunteer activity. One new result from Chapter 8 is that informal community links that already exist, due to farm household members visiting others or having others visit them, are likely to have a positive association with the decision of farm household members to participate in voluntary and community activities. Thus, for public policy programs that seek to improve the well-being of the rural population and promote rural sustainability, it seems important to note that social capital generation may be cumulative in the sense that greater involvement with others in one sphere seems likely to

lead to greater involvement in other spheres. One of the most substantial findings of this chapter is that farm household members who participate in voluntary activities, either in a formal or informal capacity, spend just over two standard working days volunteering over the course of a year. Thus, the policy implications for voluntary and community organisations in rural areas, trying to improve their ability to develop effective and efficient volunteer management strategies, is the better understanding of who is likely to volunteer, and among volunteers, who is likely to devote substantial amounts of time to this form of unpaid work.

In Chapter 9, the factors that influence the participation in, and the number of hours dedicated to various leisure activities among farm household members in the West of Ireland are examined using double-hurdle models. Chapter 9 also investigates the diversity of participation in various types of leisure activities, specifically active leisure, passive leisure and social entertainment. The findings in this chapter have broad ramifications for societal well-being. One of the new findings to emerge from this chapter is that rurality or distance from nearest village or town has a positive effect on the time allocated to passive leisure activities. Thus, leisure service planners, health policy executives and local authority representatives who aim to increase sociability and decrease participation in passive leisure activities should work towards increasing accessibility to community and social networks and thus prevent social isolation. This analysis also finds that individual, farm and household characteristics, economic variables, day of the week and time constraints contribute to differences in participation and time use in active leisure, passive leisure and social entertainment, but their effects and relative importance vary between category of leisure activity. In light of this, policy makers and interest groups with the aim of informing or educating members of the population in relation to the benefits or adverse effects of certain leisure activities should be aware that the leisure activity they are interested in will most likely be influenced by factors different to those affecting participation or level of participation in other leisure activities.

10.3 Limitations of Research

Although a description of the caveats of time use research is included in Section 3.6, there are a number of potential limitations or caveats specific to this research that should be recognised.

First, the main aim of this research is to collect and analyse time use data from a sample of farm household members in the West of Ireland. Due to issues of confidentiality, the availability of contact details for farm households was restricted and the data collection was limited to just four counties: Galway, Sligo, Mayo and Roscommon. The household response rate was 10% with 191 households returning 282 eligible respondent booklets. This corresponded to 261 usable weekday diaries and 259 usable weekend day diaries or 520 diaries in total. Though a larger number of household responses is desirable for more robust analysis, the data is representative of these counties and no claims of statistical significance beyond this delimit are made. Notwithstanding this, the structure of agriculture in these areas is arguably similar to that in other parts of Ireland, the rest of the Western region in particular, though behavioural characteristics may be considerably different.

As the results reported in Chapter 6 are from the first time use study carried out on farm household members in Ireland, it cannot be fully evaluated whether time spent on various activities has increased or declined over time. However the data does allow cautious comparisons between the results from the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey* and the first national results on time use in Ireland from the Irish National Time Use Survey conducted in 2005 (ESRI, 2005). It would make a significant contribution to the research if it were possible to make explicit comparisons between the data from the *Time Use of Farm Household Members in the West of Ireland Survey 2011/12* and the survey conducted by the ESRI however it is not possible to identify farmers or individuals living in farm household from the ESRI dataset so such comparisons are not possible.

There are several caveats that apply to the work in Chapter 7. Much of the discussion is qualitative in nature without rigorous test statistics applied to test the statistical significance of the differences noted. Bivariate analysis, presented in the cross-tabulations, is a preliminary step in understanding the nature of association between a pair of variables. These associations should not be taken as indicating a causal relationship. While two-way tables make the data easy to interpret, they increase the risk of drawing erroneous inferences, because the relationship between two variables may often depend on other variables. A relationship or association evident in a two-way table may be spurious and not evident when other variables are controlled for. Similarly, an apparent absence of association between the

cross-tabulated variables does not necessarily mean they are unrelated. Critical variables excluded from the table may be masking a relationship that really does exist. Thus, multivariate analysis is needed to validate the cross-tabulation results. Nonetheless, cross-tabulations motivate future empirical work and provide the basis for future research.

One of the limitations of the analyses in Chapter 8 is that the number of respondents that reported participation in voluntary activities in the time use diaries was small, restricting the accuracy of the double-hurdle model of predicting the determinants of volunteering. Thus, caution should be exercised when making conclusions about civic engagement or volunteering based on the time use data alone. Time use diaries miss infrequent activities, such as civic engagement or volunteering, as they are not necessarily activities that individuals engage in on a daily basis. Despite this, it can be argued that research on volunteering derived from time use diaries can provide valuable information due to the nature of the survey instrument and particularly when used in conjunction with individual questionnaire data. Finally, due to the cross-sectional nature of the data analysed, the estimated effects should be considered as associations as opposed to causal effects. Further econometric analysis is required in order to make inferences as to the causal effects of the individual, economic, household and farm characteristics as well as indicators of social capital on civic engagement and volunteering.

Finally, a number of important caveats associated with the analysis in Chapter 9 should be highlighted. Once again, further econometric analysis is required in order to make inferences as to the causal effects of the individual, farm and household characteristics, economic variables, day of the week and time constraints on participation and level of participation in the various categories of leisure activity analyses in this chapter. As this is the first time that a time use study in Ireland has been used to measure the time allocated to leisure activities of farm household members, there is no data with which to compare these results. However, one potential extension for future research is to utilize the data from the Irish National Time Use Survey conducted in 2005 (ESRI, 2005) and draw some comparisons between the participation and time use decisions of farm household members and members of the general population in leisure activities.

10.4 Avenues for Future Research

There are a number of possibilities to further advance some of the research ideas developed in this thesis. The principal focus of this research is an empirical analysis of the allocation of time of farm household members in the West of Ireland with a particular emphasis on time allocated to civic engagement, voluntary and leisure activities. A single-purpose time use diary survey and accompanying individual and household questionnaire was designed and administered to farm households in counties Galway, Sligo, Mayo and Roscommon. Thus, there exists a rich dataset from which a number of areas of research can be addressed in the future.

There is an extensive literature examining the gender division of time allocated to household labour (Press and Townsley, 1998; Bianchi *et al.*, 2000; Fafchamps and Quisumbing, 2003; McGinnity and Russell, 2008) but few using data from Ireland and even less research examining the gender division of time allocated to farm related activities. In this context, the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey* provides, for the first time, important baseline information on the patterns of time use for women and men from farm households in the West of Ireland. Further analysis of the gender dimensions of time allocation to household and farm related activities is merited in order to fully understand the division of labour among farm household members and will address a gap in the currently available empirical literature.

A further potential avenue of research is to examine the spatial distribution of time allocation to various activities. The analysis in Chapters 7 to 9 reveals that the decisions of farm household members to participate in civic engagement, voluntary and leisure activities are based on the geographical locations of the farm households in which they reside. Thus, there are almost certainly gradients with respect to rurality or distance from urban centre and participation and level of participation in certain activities as well as the well-being of respondents. Within this context, analysis using geographical information systems could extend this research to determine the comparability of preferences between residents across different locations. This would involve geocoding respondents' residential locations to develop more specific spatial measures of proximity and accessibility.

Most people aspire to achieve a balance between their commitments to work, commitments at home, and free time for themselves. The data collected for the purpose of this thesis provides scope to investigate the work-life balance of farm household members in the West of Ireland. There are three sets of measures of work-life balance which may be utilised: the proportion of free time, the overlap of work and other dimensions of life and finally, time spent with other people. Time use diaries inform the work-life balance debate, not just by demonstrating the total volume of work more reliably than other existing measures, but also by revealing the timing of work in relation to the timing of other activities, the proportion of the day influenced by work, and the degree to which work intrudes into other dimensions of life. Time diaries also reveal who is at risk of lacking enough time alone, as well as who is at risk of spending too much time alone (Fisher and Layte, 2002).

The data collected for the purpose of this thesis can also be used to analyse the distribution of responsibility for the care of children, the elderly and people who are sick or have disabilities. The impact that providing care makes on the carer's ability to undertake paid work, and on his or her standard of living, can be documented using the data from this thesis. In Chapter 6, it was reported that a significantly larger proportion of farm household members care for adults on weekdays and weekend days, compared to the general population in Ireland that care for adults on weekdays and weekend days. The most likely reason for this is that traditionally in rural Ireland, the elderly are cared for by their extended families within their home (Tara Winthrop Private Clinic, 2004; Barry and Conlon, 2010). However, further analysis of the dimensions of time allocation to caring for the elderly are merited in order to fully understand why a larger proportion of farm household members care for adults and the impact that this has on their everyday lives.

Several studies have demonstrated that Ireland has very high self-rated health and quality of life compared to other countries in Europe (Carlson, 1998; Bobak *et al.*, 2000; Delaney *et al.*, 2007) yet few studies have examined why this is so. Moreover, the currently available literature on self-rated health and quality of life addresses dwellers in urban environments, particularly in developed, industrialised countries. There has been limited research on the well-being of rural dwellers, in particular farm household members. To this end, the data collected in the individual questionnaire and the contextual data from the diaries of the *Time*

Use of Farm Household Members in the West of Ireland 2011/12 Survey can be used to address this gap in the research literature by examining the influence of socio-demographic factors, household characteristics and a variety of indicators of social capital on self-rated health and quality of life of farm household members in the West of Ireland. This has the potential to go some way toward explaining the high levels of well-being in Ireland and may also provide important information for public policy programs that seek to improve the well-being of the rural population and promote rural sustainability.

An alternative way of analysing the variability of time use of farm household members in the West of Ireland is to count the number of activities they engage in during a given time period. Routine can be calculated by looking at how many times the same activity has been repeated during the two recording days. The number of activities people engage in during a given time period is an integer count variable, which gives rise to a non-normal distribution, and there is a large and increasing literature on the use of count data models in econometrics (Greene, 2008; Wooldridge, 2010). Thus, more varied testing, prediction and diagnostic routines can be used to analyse the time use diary data collected for the purpose of this thesis.

As noted in Chapter 4 a general open-ended question was included at the end of the individual questionnaire in the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey*. Respondents were invited to write down their thoughts and reflections on their own time use, well-being and contribution to community life. It was expected, a priori, that respondents would not have much to say however many respondents were forthcoming with information and discussed, in detail in many cases, how they felt they contributed to their communities. Though it was not intended to collect qualitative data, there is scope to conduct qualitative data analysis on the information that was collected from the open-ended question.

Finally, the time use diary survey and accompanying individual and household questionnaires in this study can potentially be applied to other regions in Ireland with the aim of gathering a larger set of time use data from which to draw a clearer picture of regional differences in the determinants of time use. Such a study might provide valuable insights in the formulation of policies aimed at rural sustainability.

10.5 Policy Related Issues

This section outlines the policy-related implications and conclusions that can be drawn from this research. As noted in Chapter 1, development policies and in particular rural development policies, be they poverty alleviation, safety nets, infrastructural projects, agricultural sustainability projects or rural social inclusion programmes may benefit from the information that comes from the study of the allocation of time of farm household members. From a policy standpoint, knowing the determinants of time allocated to various activities e.g. market work, housework and childcare, helps policy-makers to understand how economic incentives affect intra-household time use and informs public policy programs that seek to improve the well-being of the rural population and promote rural sustainability.

For voluntary and community organisations, a better understanding of who is likely to volunteer, and among volunteers, who is likely to devote substantial amounts of time to this form of unpaid work, is central to improving their ability to develop effective and efficient volunteer management strategies. For public policy programs that seek to improve the well-being of the rural population and promote rural sustainability, the analysis in this thesis suggests that it is important to note that social capital generation may be cumulative in the sense that greater involvement with others in one sphere seems likely to lead to greater involvement in other spheres. One of the most substantial findings of this research is that farm household members who participate in voluntary activities, either in a formal or informal capacity, spend just over two standard working days volunteering over the course of a year. Thus, the policy implications for voluntary and community organisations in rural areas, trying to improve their ability to develop effective and efficient volunteer management strategies, is the better understanding of who is likely to volunteer, and among volunteers, who is likely to devote substantial amounts of time to this form of unpaid work.

Identifying the extent of involvement in various categories of leisure activities and understanding the factors affecting time use for leisure activities provides valuable insights for policy makers concerned with the well-being of the individual, particularly farm household members. A new finding to emerge from this research is that rurality or distance from nearest village or town has a positive effect on the time allocated to passive leisure

activities. Thus, leisure service planners, health policy executives and local authority representatives with the aim of increasing sociability and decreasing participation in passive leisure activities should work towards increasing accessibility to community and social networks and thus prevent social isolation.

In Ireland, an understanding of the factors that influence well-being has the potential to provide important information for public policy programs, yet a review of the Irish literature reveals that for those living in rural communities, the determinants of self-rated health and quality of life, indicators of well-being, are different from those living in urban communities. The analysis demonstrates that factors associated with isolation and loneliness are associated with poor health and quality of life. Thus, promoting social capital to improve health and quality of life of residents in rural communities should consider specific associations between health and different domains of social capital. Decreasing time spent alone by improving access (via public transport) to communities, encouraging people to be more active in their communities and building trust may improve health and quality of life, particularly in villages and towns that are greater than 500 people. Consequently, this analysis highlights that social capital can be key to the creation of well-being and health among farm household members in the West of Ireland. Traditional rural communities enjoy dense social and family networks and the evidence points to a protective effect of this for health and quality of life. This suggests that public policy programs should aim to improve access to villages and towns and the social support networks of people living in rural areas in order to improve the well-being of the rural population and promote rural sustainability.

10.6 Concluding Remarks

The purpose of this thesis was to explore the allocation of time of farm household members in the West of Ireland. More specifically, it sets out an approach for public policy programs that seek to improve the well-being of the rural population and promote rural sustainability. This area has been subject to very few previous academic studies and no time use studies, and is therefore a good choice for an original piece of work. In pursuing this objective, this thesis makes a number of contributions to the currently available literature. First, the *Time Use of Farm Household Members in the West of Ireland 2011/12 Survey* which forms the basis for

this thesis provides a baseline study, collecting, for the first time, detailed micro level time use data on farm household members in the West of Ireland and in doing so establishes a frame of reference for subsequent research in this field.

Second, this is the first study using a time diary methodology that paints a picture, in an Irish rural context, of the determinants of and the extent of involvement of farm household members in civic and voluntary activities. Although the results are not representative of all of rural Ireland, they nevertheless provide interesting observations leading to important conclusions which can potentially contribute to further and more comprehensive studies in other regions of rural Ireland. One of the advantages of this study is the accuracy of the time use diary data combined with data from the individual questionnaire.

Third, this research contributes to the literature by highlighting that, consistent with emerging literature, the determinants of volunteering are changing and in some cases are no longer consistent with traditional and seminal literature on the determinants of volunteer activity. The findings offer insights into the considerations that should be included in policies that seek to improve the well-being of the rural population and promote rural sustainability. This study has also brought to light the uniquely rural conditions that affect volunteering and civic engagement and highlighted the need for future research to examine volunteering through a variety of methods and by including informal volunteering in the analysis.

The fourth main contribution of this thesis is the provision of new information about the leisure time activities of farm household members in the West of Ireland. The time use diary coupled with detailed individual and household background variables used in this thesis offers fruitful tools for diversified empirical modelling of leisure behaviours and collects baseline data for future research on the leisure activities of farm household members. The analysis of time use diary data and results presented in this thesis also provide new information about the health and quality of life of farm household members in the West of Ireland.

Finally, a number of other contributions of this research deserve a mention. This study adds to the currently available literature by including an ‘alone hours’ variable in the analysis of

the participation and level of participation in voluntary and leisure time activities, as well as the study of health and quality of life of farm household members. The problem in economic modelling with time use data is that time use data is usually collected to give an aggregate picture of the use of time in a society. The data collected for the purpose of this research has been collected to record the time allocation of individual households in a specific socio-economic group in society, farm household members, making it more suitable for microeconomic research. Finally, many sub populations, such as farm household members, have unique needs and issues that must be thoroughly understood before relevant planning or intervention can occur. The time use methodology is an invaluable tool for analysing behaviour and factors that influence behaviour. In many instances there is a need to answer questions related to when, why and in what way humans participate in specific activities, as well as to detect the impact of particular stimuli on activity participation and this thesis addresses these questions. To the best of my knowledge this thesis sets out a new time use diary design for the collection of time use data and adds to the very limited time use data that is available in Ireland.

10.7 Thesis Outputs

There have been a number of outputs from the research undertaken for this thesis to date. These have been listed here for information. The research has been presented at a number of conferences and seminars both in Ireland and internationally as follows:

- The Influence of Socio-Demographic Factors, Household Characteristics, and Indicators of Social Capital on Self-Rated Health and Quality of Life, *Annual PhD Colloquium*, University of Limerick, June 2013.

- The Determinants of Time Spent on Civic Engagement and Voluntary Activities by Farm Household Members in the West of Ireland, *Department of Economics Brown Bag Seminar*, NUI Galway, March 2012.

- An Empirical Analysis of the Time Use of Farm Household Members in the West of Ireland, *The Synergy Project,* Cairnes School of Business and Economics, February 2012.

- The Determinants of Voluntary, Community and Civic Association Activities of Farm Household Members in the West of Ireland, *33rd Conference of the International Association for Time Use Research*, University of Oxford, United Kingdom. August 2011.

- The Determinants of Voluntary, Community and Civic Association Activities of Farm Household Members in the West of Ireland, *19th Annual Colloquium of the International Geographical Union*, NUI Galway, August 2011.

- The Determinants of Voluntary, Community and Civic Association Activities of Farm Household Members in the West of Ireland, 8th *Annual Conference of the Irish Society for New Economists (ISNE)*, Institute of Bankers, Dublin, August 2011.

- The Determinants of Voluntary, Community and Civic Association Activities of Farm Household Members in the West of Ireland, *International Conference of the Agricultural Economics Society (AES)*, Warwick, United Kingdom, April 2011.

- Time Spent off The Farm: Social, Community and Leisure Activities of Farm Household Members in the West of Ireland, *Teagasc Brown Bag Seminar*, Athenry, November 2010.

- Time Spent off The Farm: Social, Community and Leisure Activities of Farm Household Members in the West of Ireland, *Agricultural Economics Society of Ireland (AESI) Annual Conference*, Ashtown Research Centre, Dublin, October 2010.

- Time Spent off the Farm: Social, Community and Leisure Activities of Farm Household Members in the West of Ireland, *Department of Economics Brown Bag Seminar*, NUI Galway, February 2010.

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Appendix A

Questionnaire (First Draft)

NUI Galway
OÉ Gaillimh

SURVEY
TIME USE IN THE WEST of IRELAND
2010

Thank you for taking the time to complete this survey.

The purpose of this survey is to find out how members of farm households in the West of Ireland spend their time in the course of the day paying particular attention to time spent participating in social, community and leisure activities.

Your household was selected at random for inclusion in this survey.

There are two 'time-use' diaries – one for a weekday and one for a weekend day. At the end of the diary there are a number of questions about the diary day as well as an individual questionnaire. It would be of great assistance to me if both the farm operator and their spouse/partner in the household could each complete one of these surveys. If there is no spouse or partner in the household, the second diary can be discarded.

This diary is for a weekday. The day of the week for which I would prefer you to complete this diary is written below; beside the day you will find a space in which to fill in the date on which you completed the diary.

All of the information provided will be treated with the strictest confidence and will not be revealed to anyone or in any way, which could be associated with your name or address.

Weekday Diary

Day during a week of your choice on which I would prefer this diary to be completed:

Day: Any Monday **Date you filled in the diary:** _____

No: | | | | | |

Email: s.keogh4@nuigalway.ie, **Mobile**: (087) 6120954

A. Activity Group	Activity Code		EVENING							
			8.00 pm				9.00 pm			
			15	30	45	60	15	30	45	60
Personal Care/ Resting	1	**SLEEPING_RESTING** (relaxing, doing nothing, time out) **PERSONAL CARE** (washing, dressing, toilet) **EATING/ DRINKING** (Having a meal)								
Travel	2	**TRAVEL** including travel to and from work as well as leisure and domestic travel								
Paid Employment or Study	3	**PAID EMPLOYMENT** include paid and unpaid overtime, work from home, self-employment and farm work. Exclude lunch and other breaks								
	4	**STUDY, EDUCATION** include farm courses, night classes, studying at home. Exclude lunch and other breaks								
	5	**BREAKS FROM WORK OR STUDY** include tea/ coffee, smoking and lunch breaks								
Farm Related Activities	6	**PLANTING, HARVESTING, PICKING and WEEDING,** preparing land, spreading slurry, topping, rolling, sowing crops, harvesting crops & winter feed, etc.								
	7	**FARMING OF ANIMALS** tending, breeding, feeding, dosing, sheering, calving, milking, etc.								
	8	**FARM MAINTENANCE** fencing, building walls, maintenance of machinery, construction or repaires to infrastructure, felling of trees, etc.								
	9	**ADMINISTRATION** filling in forms e.g. single payment scheme, REPS, vetinary medicine forms, farm accounts, etc.								
Housework and Other Household Tasks	10	**COOKING** & preparing food (including making lunches), washing up, etc.								
	11	**CLEANING** the house, laundry, ironing, hoovering, tidying up, etc.								
	12	**HOUSE REPAIRS** & maintenance, DIY, gardening, vehicle maintenance, etc.								
Shopping and Appointments	13	**SHOPPING, ERRANDS & APPOINTMENTS** shopping for food or leisure, services e.g. hairdressers, doctor, paying bills, etc.								
Caring for Others	14	**CHILDCARE** looking after children, playing & talking, physical care, supervision, reading, helping with homework, etc.								
	15	**CARING FOR ADULTS** with special needs or elderly persons, in your home or elsewhere (e.g. help with personal care)								
Voluntary	16	**VOLUNTARY ACTIVITIES** for a charitable organisation, sports club (trainer, manager, selector), youth club or other organisation, include meetings, etc.								
	17	**INFORMAL HELP TO OTHER HOUSHOLDS** construction & repairs as help, help in farming & other unspecified informal help, etc.								
	18	**NON-PAID ACTIVITIES** related to farming e.g. Macra na Feirme, ICMSA, IFA, etc.								
Religious Activities	19	**RELIGIOUS ACTIVITY** Attending religious services, prayer								
Socialising and Going Out	20	**SPENDING TIME/ CHATTING WITH FAMILY, FRIENDS, NEIGHBOURS** including spouse								
	21	**PHONING/ TEXTING FAMILY, FRIENDS, NEIGHBOURS** include writing a letter								
	22	**EATING OUT/ GOING TO THE PUB** include going to cafes, bars, restaurants, nightclubs, etc.								
	23	**GOING OUT** to concerts, theatre, cinema, galleries, bookies, bingo, library, etc.								
Sports and Leisure	24	**PLAYING SPORTS, PHYSICAL EXERCISE** including playing football, walking, jogging, cycling, water sports, walking the dog, etc.								
	25	**PRODUCTIVE EXERCISE** hunting, fishing, picking berries, mushrooms, herbs, etc.								
	26	**SPORTS RELATED ACTIVITIES** going to rugby, football, soccer matches, spectating, etc.								
	27	**COMPUTER/ INTERNET FOR PERSONAL USE** e.g. play station, surfing the net, email, using computer for leisure, shopping, etc.								
	28	**HOBBIES AND OTHER LEISURE ACTIVITIES** e.g. playing musical instruments, playing cards, arts, other games, etc.								
TV and Radio	29	**WATCHING TV** and videos/ DVDs								
	30	**READING** a book, magazine or newspaper or LISTENING to the radio or music								
Other, Please Specify	31	**OTHER** (Please Specify)								

B. Who You Were With? Tick All That Apply										
		No-one/ I was alone								
		Household member								
		Others & Multiple (non-household members or household & non-household members mixed)								

C. Where Were You										
		At home								
		Community (social or recreational clubs, church, friends house etc.)								
		Travel								
		Work/ Study								

EVENING/ NIGHT													NIGHT/ EARLY MORNING												Activity Code
10.00 pm				11.00 pm				12.00 pm				1.00 am				2.00 am				3.00 am				
15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	
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A. Activity Group	Activity Code		EARLY MORNING								AFTERNOON/ EARLY EVENING																				Activity Code
			12.00 pm				1.00 pm				2.00 pm				3.00 pm				4.00 pm				5.00 pm				6.00 pm				7.00 pm				
			15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	
Personal Care/ Resting	1	**SLEEPING_RESTING** (relaxing, doing nothing, time out) **PERSONAL CARE** (washing, dressing, toilet) **EATING/ DRINKING** (Having a meal)																																	1
Travel	2	**TRAVEL** including travel to and from work as well as leisure and domestic travel																																	2
Paid Employment or Study	3	**PAID EMPLOYMENT** include paid and unpaid overtime, work from home, self-employment and farm work. Exclude lunch and other breaks																																	3
	4	**STUDY, EDUCATION** include farm courses, night classes, studying at home. Exclude lunch and other breaks																																	4
	5	**BREAKS FROM WORK OR STUDY** include tea/ coffee, smoking and lunch breaks																																	5
Farm Related Activities	6	**PLANTING, HARVESTING, PICKING and WEEDING,** preparing land, spreading slurry, topping, rolling, sowing crops, harvesting crops & winter feed, etc.																																	6
	7	**FARMING OF ANIMALS** tending, breeding, feeding, dosing, sheering, etc.																																	7
	8	**FARM MAINTENANCE** fencing, building walls, maintenance of machinery, construction or repaires to infrastructure, felling of trees, etc.																																	8
	9	**ADMINISTRATION** filling in forms e.g. single payment scheme, REPS, vetinary medicine forms, farm accounts, etc.																																	9
Housework and Other Household Tasks	10	**COOKING** & preparing food (including making lunches), washing up, etc.																																	10
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		Community (social or recreational clubs, church, friends house etc.)																																	
		Travel																																	
		Work/ Study																																	

Questionnaire: To be answered at the end of each day

1. **Was this diary day unusual in any way** (e.g. you or a family member was sick; you were on holiday from work; school holidays; you were travelling etc.)

   ☐ Yes ☐ No

2. **If yes; in what way was it unusual?** _____

   _____

3. **Did you feel rushed or stressed during the diary day?**

   ☐ Yes ☐ No

4. **When did you fill in the diary? Please tick (√) one box.**

   Now and then during the diary day ..... ☐
   At the end of the diary day ..... ☐
   The day after the diary day ..... ☐
   At a later time ..... ☐

5. **If you answered "At a later time" to the last question.** About _____ days later

6. **How long did it take you to fill in this diary?** Please tick one (√)

   Less than 10 minutes ..... ☐
   Between 10 and 20 minutes ..... ☐
   Between 20 and 30 minutes ..... ☐
   More than 30 minutes ..... ☐

7. **Did you encounter any problems filling out the diary?**

   ☐ Yes ☐ No

8. **If yes; please describe these problems as fully as possible** _____

   _____

9. **Were there any activities which you feel were not covered in the list?**

   ☐ Yes, please describe ☐ No

   _____

   _____

   _____

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OÉ Gaillimh

SURVEY
TIME USE IN THE WEST of IRELAND
2010

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This diary is for a weekend day. The day of the weekend for which I would prefer you to complete this diary is written below; beside the day you will find a space in which to fill in the date on which you completed the diary.

All of the information provided will be treated with the strictest confidence and will not be revealed to anyone or in any way, which could be associated with your name or address.

Weekend Day Diary

Day on weekend of your choice which I would prefer this diary to be completed:

Day **Sunday** **Date you filled in the diary:** _____

A. Activity Group	Activity Code		EARLY MORNING								MORNING														Activity Code
			4.00 am				5.00 am				6.00 am				7.00 am				8.00 am				9.00 am				10.00 am				11.00 am				
			15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	
Personal Care/ Resting	1	**SLEEPING_RESTING** (relaxing, doing nothing, time out) **PERSONAL CARE** (washing, dressing, toilet) **EATING/ DRINKING** (Having a meal)																																	1
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	5	**BREAKS FROM WORK OR STUDY** include tea/ coffee, smoking and lunch breaks																																	5
Farm Related Activities	6	**PLANTING, HARVESTING, PICKING and WEEDING,** preparing land, spreading slurry, topping, rolling, sowing crops, harvesting crops & winter feed, etc.																																	6
	7	**FARMING OF ANIMALS** tending, breeding, feeding, dosing, sheering, etc.																																	7
	8	**FARM MAINTENANCE** fencing, building walls, maintenance of machinery, construction or repaires to infrastructure, felling of trees, etc.																																	8
	9	**ADMINISTRATION** filling in forms e.g. single payment scheme, REPS, vetinary medicine forms, farm accounts, etc.																																	9
Housework and Other Household Tasks	10	**COOKING** & preparing food (including making lunches), washing up, etc.																																	10
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	12	**HOUSE REPAIRS** & maintenance, DIY, gardening, vehicle maintenance, etc.																																	12
Shopping and Appointments	13	**SHOPPING, ERRANDS & APPOINTMENTS** shopping for food or leisure, services e.g. hairdressers, doctor, paying bills, etc.																																	13
Caring for Others	14	**CHILDCARE** looking after children, playing & talking, physical care, supervision, reading, helping with homework, etc.																																	14
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Voluntary	16	**VOLUNTARY ACTIVITIES** for a charitable organisation, sports club (trainer, manager, selector), youth club or other organisation, include meetings, etc.																																	16
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		Community (social or recreational clubs, church, friends house etc.)																																	
		Travel																																	
		Work/ Study																																	

A. Activity Group	Activity Code		EARLY MORNING								AFTERNOON/ EARLY EVENING																				Activity Code
			12.00 pm				1.00 pm				2.00 pm				3.00 pm				4.00 pm				5.00 pm				6.00 pm				7.00 pm				
			15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	
Personal Care/ Resting	1	**SLEEPING_RESTING** (relaxing, doing nothing, time out) **PERSONAL CARE** (washing, dressing, toilet) **EATING/ DRINKING** (Having a meal)																																	1
Travel	2	**TRAVEL** including travel to and from work as well as leisure and domestic travel																																	2
Paid Employment or Study	3	**PAID EMPLOYMENT** include paid and unpaid overtime, work from home, self-employment and farm work. Exclude lunch and other breaks																																	3
	4	**STUDY, EDUCATION** include farm courses, night classes, studying at home. Exclude lunch and other breaks																																	4
	5	**BREAKS FROM WORK OR STUDY** include tea/ coffee, smoking and lunch breaks																																	5
Farm Related Activities	6	**PLANTING, HARVESTING, PICKING and WEEDING,** preparing land, spreading slurry, topping, rolling, sowing crops, harvesting crops & winter feed, etc.																																	6
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	8	**FARM MAINTENANCE** fencing, building walls, maintenance of machinery, construction or repaires to infrastructure, felling of trees, etc.																																	8
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A. Activity Group	Activity Code		EVENING								EVENING/ NIGHT												NIGHT/ EARLY MORNING								Activity Code
			8.00 pm				9.00 pm				10.00 pm				11.00 pm				12.00 pm				1.00 am				2.00 am				3.00 am				
			15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	
Personal Care/ Resting	1	**SLEEPING_RESTING** (relaxing, doing nothing, time out) **PERSONAL CARE** (washing, dressing, toilet) **EATING/ DRINKING** (Having a meal)																																	1
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		Community (social or recreational clubs, church, friends house etc.)																																	
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		Work/ Study																																	

Questionnaire: To be answered at the end of each day

1. **Was this diary day unusual in any way** (e.g. you or a family member was sick; you were on holiday from work; school holidays; you were travelling etc.)
   ☐ Yes ☐ No

2. **If yes; in what way was it unusual?** _____

   _____

3. **Did you feel rushed or stressed during the diary day?**
   ☐ Yes ☐ No

4. **When did you fill in the diary? Please tick (√) one box.**

   Now and then during the diary day ..... ☐
   At the end of the diary day ..... ☐
   The day after the diary day ..... ☐
   At a later time ..... ☐

5. **If you answered "At a later time" to the last question.** About _____ days later

6. **How long did it take you to fill in this diary?** Please tick one (√)

   Less than 10 minutes ..... ☐
   Between 10 and 20 minutes ..... ☐
   Between 20 and 30 minutes ..... ☐
   More than 30 minutes ..... ☐

7. **Did you encounter any problems filling out the diary?**
   ☐ Yes ☐ No

8. **If yes; please describe these problems as fully as possible** _____

   _____

9. **Were there any activities which you feel were not covered in the list?**
   ☐ Yes, please describe ☐ No

   _____

   _____

   _____

Background Information: Individual Questionnaire

1. **Please tick to indicate whether you are male or female:** ☐ Male ☐ Female
2. **Are you the main farm operator?** ☐ Yes ☐ No
3. **If yes;** do you consider yourself to be a full-time or part-time farmer?
   ☐ Full-time ☐ Part-time
4. **What is your age?**
   ☐ 0 - 18 yrs ☐ 19 - 25 yrs ☐ 26 - 40 yrs
   ☐ 41 - 60 yrs ☐ 61 - 70 yrs ☐ 71 + yrs
5. **What is your current marital status?**
   ☐ Married/partner ☐ Separated ☐ Single ☐ Widowed
6. **(i) Do you have any children?** ☐ Yes ☐ No

   (ii) If yes; how many? _____
7. **Which of the following best describes the highest level of education you have completed?**
   ☐ Incomplete primary education ☐ Leaving Cert or Equivalent
   ☐ Completed primary ☐ Post Leaving Cert diploma/cert
   ☐ Group/ Inter/ Junior Cert. or equivalent ☐ Third Level degree or higher
8. **How many years of education in total have you completed?** _____ years
9. **Have you completed a farm apprenticeship under a formal scheme or any part-time or full-time courses on farming or related subjects?**
   ☐ Yes ☐ No
10. **Which of the following best describes your situation regarding employment?**
    ☐ Employed *(not farming)* ☐ Unemployed
    ☐ Self-employed *(inc. full time farmers)* ☐ Looking after the home or family
    ☐ Employed & part-time farming ☐ Student full-time
    ☐ Retired ☐ Other (please specify) _____
11. **Do you have an off-farm job?** ☐ Yes ☐ No
12. **If yes;** what is your occupation? _____
13. **If yes;** how many hours per week do you normally work in your off-farm job, including regular overtime (excluding lunch breaks & inc. part-time farmers)?
    _____ hrs per wk
14. **If yes;** in general terms, do you feel that your work off the farm conflicts with your family or social commitments?
    ☐ Yes, a lot ☐ Yes, a little ☐ No
15. **If yes;** which do you regard as your primary economic activity?
    ☐ Farming ☐ Your other job ☐ Don't know

16. Average number of hours per week spent on farmwork throughout the year?

Less than 9 hrs ..... ☐
9 hrs or more but less than 18 ..... ☐
18 hrs or more but less than 27 ..... ☐
27 hrs or more but less than 36 ..... ☐
36 hrs or more ..... ☐

17. In general, how good would you say your;

Health is?	☐ Very Good	☐ Good	☐ Fair	☐ Poor	☐ Very Poor
Quality of life is?	☐ Very Good	☐ Good	☐ Fair	☐ Poor	☐ Very Poor

18. Given your present household income, how would you describe your present situation vis-à-vis your household expenses?

☐ very adequate ☐ adequate ☐ just surviving ☐ inadequate ☐ very inadequate

19. Do you think the current economic climate has had an affect on your use of time?

☐ Yes ☐ Yes, to some extent ☐ No

20. How satisfied are you with your present situation in the following areas in your life?
Using a scale of 1 to 6 could you indicate (√) your level of satisfaction with each of the following areas.

A '1' indicates that you are not satisfied at all while a '6' means that you are fully satisfied.

	Extremely Dissatisfied ←					→ Extremely Satisfied
Your work or main daily activity	☐1	☐2	☐3	☐4	☐5	☐6
Your financial situation	☐1	☐2	☐3	☐4	☐5	☐6
The amount of leisure time you have	☐1	☐2	☐3	☐4	☐5	☐6
Your life in general	☐1	☐2	☐3	☐4	☐5	☐6

21. Do you take part in any type of unpaid voluntary activity or service outside your own home or workplace on a regular basis? e.g. coaching at sports club, board of management etc.

☐ Yes ☐ No

22. If yes; please name what you feel to be the three most important voluntary or community organisations in which you are involved?

1. _____
2. _____
3. _____

23. Approximately, how many organisations, clubs or associations altogether are you a member of or associated with? (e.g. religious associations, sports groups, environmental associations)

☐

24. Have you ever been part of a project to organise a new service in your area (e.g. youth club, defibrillator programme, recreation for the elderly)?

☐ Yes ☐ No

25. Can you get help from friends when you need it?

☐ Yes ☐ No

26. In the past 4 weeks have you visited anyone in their home, apart from a family member or other relative, as part of a social visit or to provide them with some form of voluntary help or assistance in their home?

☐ Yes ☐ No

27. In the past 4 weeks has anyone visited you in your home, apart from a family member or other relative, as part of a social visit or to provide you with some form of voluntary help or assistance in your home?

☐ Yes ☐ No

28. Does your local community feel like home?

☐ Yes ☐ No

29. When you go shopping in your local area, are you likely to run into friends and acquaintances?

☐ Yes ☐ No

30. Generally speaking, would you say that in your area;

☐ Most people can be trusted ☐ You can never be too careful ☐ Don't know

31. Do you feel that the area in which you live is a safe place?

☐ Yes ☐ No

32. Frequency of information in the last twelve months

1 = One occasion 3 = A few times 5 = A few times per month 7 = A few times per week
2 = Two occasions 4 = Once a month 6 = Once a week 8 = Daily

Please tick any of the following activities that you have participated in or have been affiliated with in the last 12 months?		**Please indicate the frequency of the activity in the last 12 months** *(use codes above)*
Irish Farmers Association (IFA)	☐	
Macra na Feirme	☐	
Teagasc Meetings	☐	
Irish Cattle & Sheep Farmers Association (ICSA)	☐	
Irish Creamery Milk Suppliers Association (ICMSA).....	☐	
Irish Countrywomen's Association (ICA)	☐	
The GAA	☐	
Rugby Football Union (RFU)	☐	
Youth Clubs (Foróige etc.)	☐	
Festival Organisation Committee	☐	
Royal National Lifeboat Institution (RNLI)	☐	
Tidy Towns Committee	☐	
Comhaltas Ceoltóirí Eireann (CCE)	☐	
Senior Citizen Community	☐	
Community Responder Programme	☐	
Community Alert Programme	☐	
Other *(Please specify)* _____	☐	
Other *(Please specify)* _____	☐	

Household Questionnaire

1. **How many people live in this household in total?** ☐

2. **How many of those resident in the household are aged;**

0 - 18	19 - 25	26 - 40	41 - 55	56 - 65	66 < 70	70 or older
☐	☐	☐	☐	☐	☐	☐

3. **How long has your family been living/ farming in this area or community?**

☐ 1 – 10 years ☐ 11 – 20 years ☐ 20 – 50 years ☐ 50 – 100 years ☐ Over 100 years

4. **(i) Have you any plans to move from this address?**

☐ Yes ☐ No

(ii) If yes: Reason for move _____

_____

5. **What is the approximate distance from your household to the nearest village, town or urban centre**

☐ Miles ☐ Km ☐ Don't Know

6. **Which of the following would you say best describes the size of the location where you live?**

Open country	☐	Town of 5,000 – less than 10,000 people ...	☐
Village of less than 1,500 people ...	☐	Town or city, 10,000 or more ...	☐
Town of 1,500 – less 5,000 people ...	☐	Dublin City or County	☐

7 **(i) What is the total agricultural area of your farm** *(incl. farm forestry)* _____ *ha*

(ii) No. of hectares of owned land? _____ *ha*

(iii) No. of hectares rented-in? _____ *ha*

(iv) No. of hectares rented/leased to others? _____ *ha*

(v) How much of the area is utilisable agricultural area (UAA)**?** _____ *ha*

8. **Which do you think best describes your predominant farming system?**

☐ Specialist Beef Production ☐ Specialist Tillage
☐ Specialist Sheep ☐ Mixed Grazing Livestock
☐ Specialist Dairy ☐ Other (please specify) _____

9. **Is there a potential heir to the farm in the household?**

☐ Yes ☐ No

10. **If yes;** is the heir likely to take over the running of the farm in the next five years?

☐ Yes, full-time ☐ Yes, combined with another job ☐ No ☐ Don't know

11. **If there is no heir or the heir is not likely to take over in the next five years what do you think will happen the farm in the longer term**

☐ Rented out ☐ Will be sold ☐ Will be under forestry

☐ Other (specify) _____

12. **Do/did you participate in REPS at any time?**

☐ Yes ☐ No

13. **How much of a difference has the Single Farm Payment had on how you run your farm today, compared with the old subsidy system?**

☐ None ☐ Slight ☐ Major

Please describe what has changed: _____

_____

_____

14. **Do you have any other business(es) based on/at the farm (e.g. agri-tourism, food processing, horticulture, etc.)**

☐ Yes ☐ No

If yes;

Type of Business	Years in operation

15. **In which of the following categories did the total gross (before taxes or deductions) FARM income of your household fall in 2009?**

< €4,999	€5,000 - €9,999	€10,000 - €19,999	€20,000 - €29,999	€30,000 - €39,999	€40,000 - €49,999	€50,000 - €59,999	€60,000 - €69,999	€70,000 - €78,999	≥ €80,000
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

16. **What proportion of your on-farm income comes from grants and subsidies inc. single farm payments and REPS?**

☐ less than 25% ☐ 26-50% ☐ 51-75% ☐ more than 76%

17. **Over the last five years has the annual on - farm income**

☐ Remained the same ☐ Increased ☐ Decreased

18. **(i) Does your household have an off-farm income?**

☐ Yes ☐ No

(ii) If yes; who works off-farm and since when

☐ farm operator _____ *(year of start)*
☐ spouse _____ *(year of start)*

(iii) If yes; in which of the following categories did the total gross (before taxes or deductions) **off-farm income** of your household fall in **2009**?

< €4,999	€5,000 - €9,999	€10,000 - €19,999	€20,000 - €29,999	€30,000 - €39,999	€40,000 - €49,999	€50,000 - €59,999	€60,000 - €69,999	€70,000 - €78,999	≥ €80,000
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Appendix B

Questionnaire (Final Draft)

NUI Galway
OÉ Gaillimh

SURVEY
TIME USE OF FARM HOUSEHOLDS IN THE WEST of IRELAND
2011/2012

The purpose of this survey is to find out how members of farm households in the West of Ireland spend their time in the course of the day paying particular attention to time spent participating in social, community and leisure activities.

This booklet is the diary part of the survey. There are two booklets included in the envelope; it would be of great assistance to me if both the farm operator and their spouse/partner in the household could each complete one of these booklets. If there is no spouse or partner in the household, the second diary or booklet can be discarded.

Included in this booklet you will find:

1. **Sample diary** – this is for demonstration purposes only. It will help you in filling out the diary

2. **Diary Instructions** – Detailed instructions on how to complete the diary

3. **Weekday diary**

4. **Weekend day diary**

5. **Individual Questionnaire**

All of the information provided will be treated with the strictest confidence and will not be revealed to anyone or in any way which could be associated with your name or address.

Email: s.keogh4@nuigalway.ie, **Mobile:** (087) 6120954

No.				

A. Activity Group	Activity Code		Activity Code
Personal Care/ Resting	1	**SLEEPING/ RESTING** (relaxing, doing nothing, time out, thinking) **PERSONAL CARE** (washing, dressing, bathroom) **EATING/ DRINKING** (having a meal)	1
Travel	2	**TRAVEL** including travel to and from work as well as free time and domestic travel e.g. dropping kids to school, driving to the shop, etc.	2
Paid Employment or Study	3	**PAID EMPLOYMENT excluding farming,** include paid and unpaid overtime, work from home, self-employment. Exclude lunch and other breaks	3
	4	**STUDY, EDUCATION** include farm courses, night classes, studying at home. Exclude lunch and other breaks	4
	5	**BREAKS FROM WORK OR STUDY** include tea/ coffee, smoking and lunch breaks	5
Farm Related Activities	6	**PLANTING, HARVESTING, PICKING and WEEDING,** preparing land, spreading slurry, topping, rolling, sowing crops, harvesting crops & winter feed, etc.	6
	7	**FARMING OF ANIMALS** tending, breeding, feeding, dosing, sheering, etc.	7
	8	**FARM MAINTENANCE** fencing, building walls, maintenance of machinery, construction or repairs to infrastructure, felling of trees, etc.	8
	9	**ADMINISTRATION** filling in forms e.g. single payment scheme, REPS, veterinary medicine forms, farm accounts, etc.	9
	10	**NON-PAID ACTIVITIES** related to farming e.g. attending Macra na Feirme, ICMSA or IFA meetings, etc.	10
Housework and Other Household Tasks	11	**COOKING** & food preparation (including making lunches), washing up, making tea, etc.	11
	12	**HOUSEWORK** include laundry, cleaning, ironing, hoovering, tidying up, changing beds, etc.	12
	13	**OTHER DOMESTIC WORK** include house repaire & maintenance, DIY, odd jobs, lawn & garden care, vehicle maintenance, saving turf, pet care, etc.	13
Shopping and Appointments	14	**SHOPPING, ERRANDS & APPOINTMENTS** shopping for food or leisure, using services e.g. going to the hairdressers, doctor, paying bills, etc.	14
Caring for Others	15	**CHILDCARE** looking after children, playing & talking, physical care, supervision, reading, helping with homework, etc.	15
	16	**CARING FOR ADULTS** with special needs or elderly persons, in your home or elsewhere (e.g. help with personal care)	16
Voluntary	17	**CIVIC ACTIVITIES** voluntary/ organisational work, dealing with police, political/community/trade union meetings, organising sports/coaching, filling survey, providing meals, scouts/ youth clubs, etc.	17
	18	**INFORMAL HELP TO OTHER HOUSHOLDS** construction & repairs as help, help in farming & other unspecified informal help, etc.	18
Religious Activities	19	**RELIGIOUS ACTIVITY** attending religious services, prayer, etc.	19
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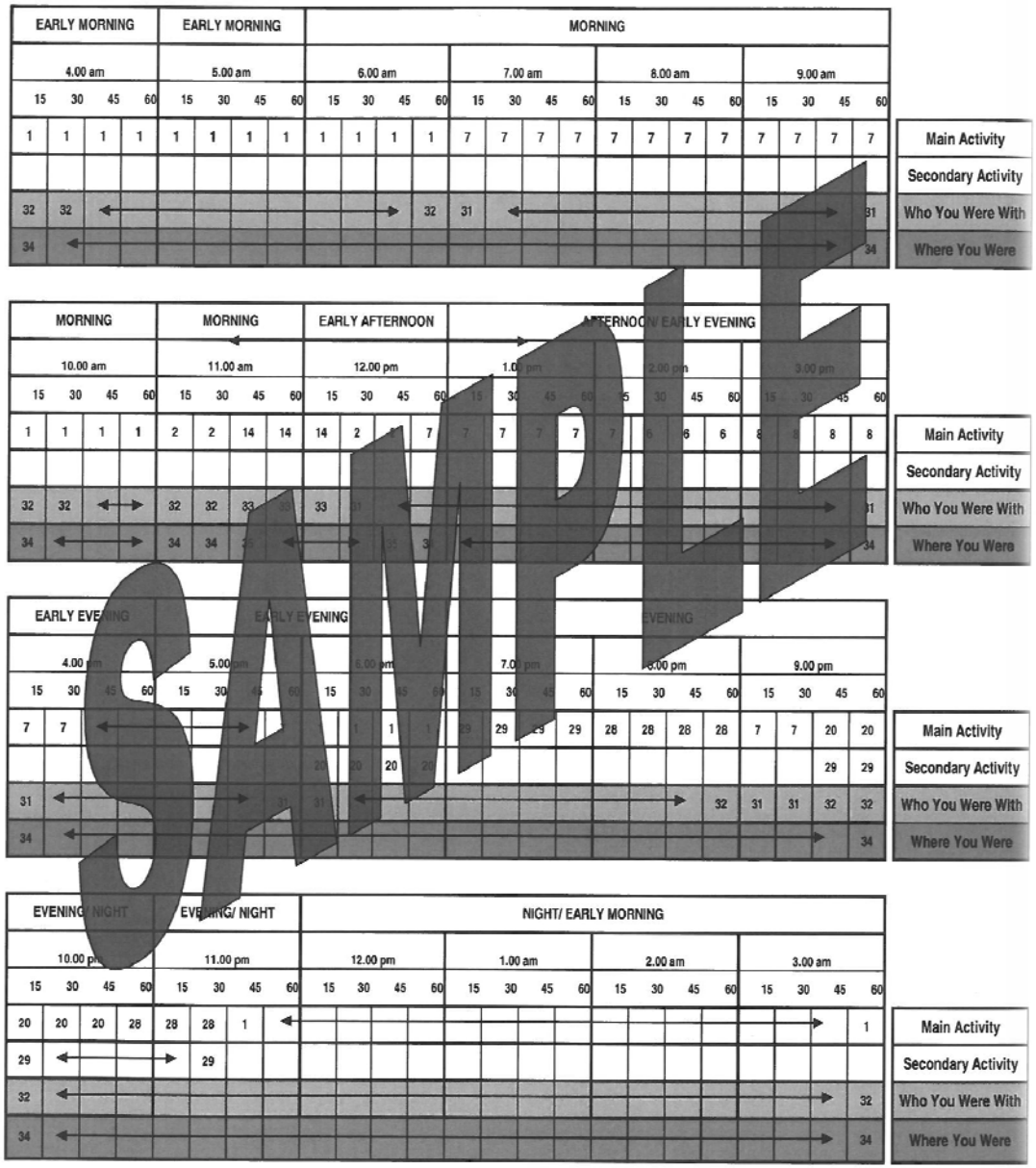
	21	**PHONING/TEXTING FAMILY, FRIENDS** or **NEIGHBOURS** include writing an e-mail/ letter, using social network sites e.g. Facebook, Twitter, etc.	21
	22	**EATING OUT** or **GOING OUT** include going to cafes, bars, restaurants, nightclubs, concerts, theatre, cinema, galleries, bookies, bingo, library, etc.	22
Sports, Exercise and Leisure	23	**PLAYING SPORTS, PHYSICAL EXERCISE** including playing football, walking, jogging, cycling, golfing, horse riding, water sports, walking the dog, etc.	23
	24	**PRODUCTIVE EXERCISE** such as hunting, fishing, picking berries, mushrooms, herbs, etc.	24
	25	**ATTENDING SPORTS RELATED ACTIVITIES** spectating, going to rugby, football, soccer matches, etc.	25
	26	**COMPUTER/ INTERNET FOR PERSONAL USE** e.g. games consoles, play station, surfing the net, using the computer for leisure, shopping, etc.	26
	27	**HOBBIES** and **OTHER LEISURE ACTIVITIES** e.g. playing musical instruments, playing cards, arts, other games, etc.	27
TV and Radio	28	**WATCHING TV** and videos/ DVDs or **LISTENING** to the radio, records or cds, etc.	28
	29	**READING** a book, magazine, newspaper or letter, etc.	29
Other, Please Specify	30	**OTHER** (Please Specify)	30

Main Activity
Secondary Activity
Who You Were With
Where You Were

B. Who You Were With? Tick All That Apply			
	31	**No-one/** I was alone	31
	32	**Household members/ partner or children**	32
	33	**Household members &/or other persons I know**	33

C. Where Were You			
	34	**At home** (inc. on the farm)	34
	35	**Community** (social or recreationsl clubs, church, friends house, etc.)	35
	36	**Other** (work, study, travel, etc.)	36



SAMPLE

This is a completed time-use diary of a farm operator on a given weekday. This individual was sleeping/resting/eating between 4.00 & 7.00am. They were farming animals between 7.00 & 10.00am. Between 10.00 & 11.00am., they were resting/eating and from 11.00 until 11.30am. they were travelling. While they were travelling, they were also listening to the radio (secondary activity). We can see from the diary that while this farm operator was resting/relaxing between 4.00 & 7.00a.m., they were with a household member & were at home. Between 12.15 & 12.45 pm, they were alone & in the community.

Diary Instructions

Included in this booklet are two diaries; one to be filled in on a weekday and the other on a weekend day. This will give us a better estimation of time use over the course of a week as time-use tends to differ between weekdays and weekends days.

The aim of each diary is to show what you were doing for each 15 minute period of the day in question. It can be filled out now and again throughout the day or at the end of the designated day. It should take no more than 15 minutes to fill each diary.

The diary starts at 4am, and continues for a full 24 hours.

- A number of activities are listed and numbered down the page on the left. The timeslots are listed in four rows across the page on the right. Starting at 4am, look down through the list of activities and identify the one you are doing for each time slot.
- We are particularly interested in your main activity during each 15 minute period. For each activity you were doing, please mark in the box provided, the number corresponding to your main or primary activity at that time.
- If you were doing two things at the same time, please mark in the second row of boxes, labelled secondary activity, the number corresponding to the secondary activity you were doing at that time
- If you were doing more than two things at the same time, decide which two activities demanded most attention.
- If you make a mistake, please just cross it out or erase it.
- Sometimes it is difficult to decide which category an activity falls into. If this is the case, choose the activity that comes closest to what you were doing or use the "other" activities at the bottom and fill in the activity you were doing at that time.
- **Please make sure that you have some activity ticked for each 15 minute time slot.**
- In the third and fourth rows labelled "Who you were with" and "Where you were", please indicate, using the appropriate number, who you were with, if you were with anybody and where you were at the time of each activity. You will find a short list of places and people you may have been with at the time of each activity at the bottom of the list of activities.

Email: s.keogh4@nuigalway.ie, **Mobile**: (087) 6120954

NUI Galway
OÉ Gaillimh

SURVEY
TIME USE OF FARM HOUSEHOLDS IN THE WEST of IRELAND
2011/2012

Thank you for taking the time to complete this survey.

This diary is for a weekday. The day of a week of your choice for which we would prefer you to complete this diary is written below; beside the day you will find a space in which to fill in the date on which you completed the diary.

At the end of this diary there are a number of questions about the diary day.

All of the information provided will be treated with the strictest confidence and will not be revealed to anyone or in any way, which could be associated with your name or address.

This blank diary is for a

Weekday

Day of a week of your choice on which we would prefer this diary to be completed:

Day: **Any Monday** **Date you filled in the diary:** _____

Email: s.keogh4@nuigalway.ie, **Mobile**: (087) 6120954

A. Activity Group	Activity Code		Activity Code
Personal Care/ Resting	1	**SLEEPING/ RESTING** (relaxing, doing nothing, time out, thinking) **PERSONAL CARE** (washing, dressing, bathroom) **EATING/ DRINKING** (having a meal)	1
Travel	2	**TRAVEL** including travel to and from work as well as free time and domestic travel e.g. dropping kids to school, driving to the shop, etc.	2
Paid Employment or Study	3	**PAID EMPLOYMENT excluding farming,** include paid and unpaid overtime, work from home, self-employment. Exclude lunch and other breaks	3
	4	**STUDY, EDUCATION** include farm courses, night classes, studying at home. Exclude lunch and other breaks	4
	5	**BREAKS FROM WORK OR STUDY** include tea/ coffee, smoking and lunch breaks	5
Farm Related Activities	6	**PLANTING, HARVESTING, PICKING and WEEDING,** preparing land, spreading slurry, topping, rolling, sowing crops, harvesting crops & winter feed, etc.	6
	7	**FARMING OF ANIMALS** tending, breeding, feeding, dosing, sheering, etc.	7
	8	**FARM MAINTENANCE** fencing, building walls, maintenance of machinery, construction or repairs to infrastructure, felling of trees, etc.	8
	9	**ADMINISTRATION** filling in forms e.g. single payment scheme, REPS, veterinary medicine forms, farm accounts, etc.	9
	10	**NON-PAID ACTIVITIES** related to farming e.g. attending Macra na Feirme, ICMSA or IFA meetings, etc.	10
Housework and Other Household Tasks	11	**COOKING** & food preparation (including making lunches), washing up, making tea, etc.	11
	12	**HOUSEWORK** include laundry, cleaning, ironing, hoovering, tidying up, changing beds, etc.	12
	13	**OTHER DOMESTIC WORK** include house repaire & maintenance, DIY, odd jobs, lawn & garden care, vehicle maintenance, saving turf, pet care, etc.	13
Shopping and Appointments	14	**SHOPPING, ERRANDS & APPOINTMENTS** shopping for food or leisure, using services e.g. going to the hairdressers, doctor, paying bills, etc.	14
Caring for Others	15	**CHILDCARE** looking after children, playing & talking, physical care, supervision, reading, helping with homework, etc.	15
	16	**CARING FOR ADULTS** with special needs or elderly persons, in your home or elsewhere (e.g. help with personal care)	16
Voluntary	17	**CIVIC ACTIVITIES** voluntary/ organisational work, dealing with police, political/community/trade union meetings, organising sports/coaching, filling surveys, providing meals, scouts/ youth clubs, etc.	17
	18	**INFORMAL HELP TO OTHER HOUSHOLDS** construction & repairs as help, help in farming & other unspecified informal help, etc.	18
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	21	**PHONING/ TEXTING FAMILY, FRIENDS** or **NEIGHBOURS** include writing an e-mail/ letter, using social network sites e.g. Facebook, Twitter, etc.	21
	22	**EATING OUT** or **GOING OUT** include going to cafes, bars, restaurants, nightclubs, concerts, theatre, cinema, galleries, bookies, bingo, library, etc.	22
Sports, Exercise and Leisure	23	**PLAYING SPORTS, PHYSICAL EXERCISE** including playing football, walking, jogging, cycling, golfing, horse riding, water sports, walking the dog, etc.	23
	24	**PRODUCTIVE EXERCISE** such as hunting, fishing, picking berries, mushrooms, herbs, etc.	24
	25	**ATTENDING SPORTS RELATED ACTIVITIES** spectating, going to rugby, football, soccer matches, etc.	25
	26	**COMPUTER/ INTERNET FOR PERSONAL USE** e.g. games consoles, play station, surfing the net, using the computer for leisure, shopping, etc.	26
	27	**HOBBIES** and **OTHER LEISURE ACTIVITIES** e.g. playing musical instruments, playing cards, arts, other games, etc.	27
TV and Radio	28	**WATCHING TV** and videos/ DVDs or **LISTENING** to the radio, records or cds, etc.	28
	29	**READING** a book, magazine, newspaper or letter, etc.	29
Other, Please Specify	30	**OTHER** (Please Specify)	30

Main Activity
Secondary Activity
Who You Were With
Where You Were

B. Who You Were With? Tick All That Apply			
	31	No-one/ I was alone	31
	32	Household members/ partner or children	32
	33	Household members &/or other persons I know	33

C. Where Were You			
	34	**At home** (inc. on the farm)	34
	35	**Community** (social or recreationsl clubs, church, friends house, etc.)	35
	36	**Other** (work, study, travel, etc.)	36

EARLY MORNING				EARLY MORNING				MORNING											
4.00 am				5.00 am				6.00 am				7.00 am				8.00 am			
15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60

Main Activity
Secondary Activity
Who You Were With
Where You Were

MORNING				MORNING				EARLY AFTERNOON				AFTERNOON/ EARLY EVENING							
10.00 am				11.00 am				12.00 pm				1.00 pm				2.00 pm			
15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60

Main Activity
Secondary Activity
Who You Were With
Where You Were

EARLY EVENING				EARLY EVENING				EVENING											
4.00 pm				5.00 pm				6.00 pm				7.00 pm				8.00 pm			
15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60

Main Activity
Secondary Activity
Who You Were With
Where You Were

EVENING/ NIGHT				EVENING/ NIGHT				NIGHT/ EARLY MORNING											
10.00 pm				11.00 pm				12.00 pm				1.00 am				2.00 am			
15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60

Main Activity
Secondary Activity
Who You Were With
Where You Were

Questionnaire: To be answered at the end of the diary day

1. **Was this diary day unusual in any way** (e.g. you or a family member was sick; you were on holiday from work; school holidays; you were travelling etc.)
   ☐ Yes ☐ No

2. **If yes; in what way was it unusual?** _____

   _____

3. **Did you feel rushed or stressed during the diary day?**
   ☐ Yes ☐ No

4. **When did you fill in the diary? Please tick (√) one box.**
   Now and then during the diary day ..... ☐
   At the end of the diary day ..... ☐
   The day after the diary day ..... ☐
   At a later time ..... ☐

5. **If you answered "At a later time" to the last question;** About _____ days later

6. **If you encountered any problems filling out the diary or there were any activities which you feel were not covered in the list, please use this space to describe them as fully as possible.**

   _____
   _____
   _____
   _____
   _____
   _____
   _____
   _____
   _____
   _____

NUI Galway
OÉ Gaillimh

SURVEY
TIME USE OF FARM HOUSEHOLDS IN THE WEST of IRELAND
2011/2012

Thank you for taking the time to complete this survey.

This diary is for a weekend day. The day of a weekend of your choice for which we would prefer you to complete this diary is written below; beside the day you will find a space in which to fill in the date on which you completed the diary.

At the end of this diary there are a number of questions about the diary day as well as an individual questionnaire.

All of the information provided will be treated with the strictest confidence and will not be revealed to anyone or in any way, which could be associated with your name or address.

This blank diary is for a

Weekend Day

Day on a weekend of your choice on which we would prefer this diary to be completed:

Day: **Any Sunday** **Date you filled in the diary:** _____

A. Activity Group	Activity Code		Activity Code
Personal Care/ Resting	1	**SLEEPING/ RESTING** (relaxing, doing nothing, time out, thinking) **PERSONAL CARE** (washing, dressing, bathroom) **EATING/ DRINKING** (having a meal)	1
Travel	2	**TRAVEL** including travel to and from work as well as free time and domestic travel e.g. dropping kids to school, driving to the shop, etc.	2
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	7	**FARMING OF ANIMALS** tending, breeding, feeding, dosing, sheering, etc.	7
	8	**FARM MAINTENANCE** fencing, building walls, maintenance of machinery, construction or repairs to infrastructure, felling of trees, etc.	8
	9	**ADMINISTRATION** filling in forms e.g. single payment scheme, REPS, veterinary medicine forms, farm accounts, etc.	9
	10	**NON-PAID ACTIVITIES** related to farming e.g. attending Macra na Feirme, ICMSA or IFA meetings, etc.	10
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Caring for Others	15	**CHILDCARE** looking after children, playing & talking, physical care, supervision, reading, helping with homework, etc.	15
	16	**CARING FOR ADULTS** with special needs or elderly persons, in your home or elsewhere (e.g. help with personal care)	16
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	21	**PHONING/ TEXTING FAMILY, FRIENDS** or **NEIGHBOURS** include writing an e-mail/ letter, using social network sites e.g. Facebook, Twitter, etc.	21
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	24	PRODUCTIVE EXERCISE such as hunting, fishing, picking berries, mushrooms, herbs, etc.	24
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	29	**READING** a book, magazine, newspaper or letter, etc.	29
Other, Please Specify	30	**OTHER** (Please Specify)	30

Main Activity
Secondary Activity
Who You Were With
Where You Were

B. Who You Were With? Tick All That Apply			
	31	**No-one**/ I was alone	31
	32	**Household members/ partner or children**	32
	33	**Household members &/or other persons I know**	33

C. Where Were You			
	34	**At home** (inc. on the farm)	34
	35	**Community** (social or recreationsl clubs, church, friends house, etc.)	35
	36	**Other** (work, study, travel, etc.)	36

EARLY MORNING				EARLY MORNING				MORNING												Main Activity
4.00 am				5.00 am				6.00 am				7.00 am				8.00 am				9.00 am				Secondary Activity
15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	Who You Were With
																								Where You Were

MORNING				MORNING				EARLY AFTERNOON				AFTERNOON/ EARLY EVENING												Main Activity
10.00 am				11.00 am				12.00 pm				1.00 pm				2.00 pm				3.00 pm				Secondary Activity
15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	Who You Were With
																								Where You Were

EARLY EVENING				EARLY EVENING								EVENING												Main Activity
4.00 pm				5.00 pm				6.00 pm				7.00 pm				8.00 pm				9.00 pm				Secondary Activity
15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	Who You Were With
																								Where You Were

EVENING/ NIGHT				EVENING/ NIGHT				NIGHT/ EARLY MORNING																Main Activity
10.00 pm				11.00 pm				12.00 pm				1.00 am				2.00 am				3.00 am				Secondary Activity
15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	Who You Were With
																								Where You Were

Questionnaire: To be answered at the end of each day

1. **Was this diary day unusual in any way** (e.g. you or a family member was sick; you were on holiday from work; school holidays; you were travelling etc.)

   ☐ Yes ☐ No

2. **If yes; in what way was it unusual?** _____

   _____

3. **Did you feel rushed or stressed during the diary day?**

   ☐ Yes ☐ No

4. **When did you fill in the diary? Please tick (√) one box.**

   Now and then during the diary day ..... ☐
   At the end of the diary day ..... ☐
   The day after the diary day ..... ☐
   At a later time ..... ☐

5. **If you answered "At a later time" to the last question;** About _____ days later

6. **If you encountered any problems filling out the diary or there were any activities which you feel were not covered in the list, please use this space to describe them as fully as possible.**

   _____
   _____
   _____
   _____
   _____
   _____
   _____
   _____
   _____
   _____

Background Information: Individual Questionnaire

1. **Please tick to indicate whether you are male or female:** ☐ Male ☐ Female

2. **(i) Are you the main farm operator?** ☐ Yes ☐ No

   (ii) If yes; do you consider yourself;

   ☐ A full-time farmer ☐ A part-time farmer

3. **What is your age?**

   ☐ 0 - 18 yrs ☐ 19 - 25 yrs ☐ 26 - 40 yrs
   ☐ 41 - 60 yrs ☐ 61 - 70 yrs ☐ 71 + yrs

4. **What is your current marital status?**

   ☐ Married/partner ☐ Separated ☐ Single ☐ Widowed

5. **(i) Do you have any children?** ☐ Yes ☐ No

   (ii) If yes; how many? _____

6. **Which of the following best describes the highest level of education you have completed?**

   ☐ Incomplete primary education ☐ Leaving Cert or equivalent
   ☐ Completed primary ☐ Post Leaving Cert diploma/cert
   ☐ Group/ Inter/ Junior Cert. or equivalent ☐ Third Level degree or higher

7. **How many years of education in total have you completed?** _____ years

8. **Have you completed a farm apprenticeship under a formal scheme or any part-time or full-time courses on farming or related subjects?**

   ☐ Yes ☐ No

9. **Which of the following best describes your situation regarding employment?**

   ☐ Employed *(not farming)* ☐ Unemployed
   ☐ Self-employed *(inc. full time farmers)* ☐ Looking after the home or family
   ☐ Employed & part-time farming ☐ Student full-time
   ☐ Retired ☐ Other (please specify) _____

10. **Do you have an off-farm job?** ☐ Yes ☐ No

    If yes, please answer the following;

    (i) What is your occupation? _____

    (ii) How many hours per week do you normally work in your off-farm job, including regular overtime (excluding lunch breaks & inc. part-time farmers)?

    _____ hrs per wk

11. **What is the average number of hours per week that you spend on farmwork?**

    ☐ 0 hrs ☐ 18 hrs or more but less than 27
    ☐ Less than 9 hrs ☐ 27 hrs or more but less than 36
    ☐ 9 hrs or more but less than 18 ☐ 36 hrs or more

12. **(i) Do you take part in any type of unpaid voluntary activity or service outside your own home or workplace on a REGULAR basis? e.g. helping with fund-raising, visiting the elderly, St. Vincent de Paul, coaching in a sports club, parish group, etc.**

    ☐ Yes ☐ No

13. (i) In the last 12 months, have you been actively involved in any type of voluntary or community group such as sports, residents or professional association, parish group, political party, trade union, etc. (active means attending meetings, being a member, etc.)

☐ Yes ☐ No

(ii) If yes; please name what you feel to be the three most important voluntary or community organisations in which you were actively involved?

1. _____
2. _____
3. _____

14. During the last 12 months have you? *(Tick all that apply)*

- ☐ Attended a public meeting
- ☐ Joined an action group of any kind
- ☐ Written to a newspaper
- ☐ Contacted or appeared on radio/TV
- ☐ Undertaken unpaid voluntary work in a political party
- ☐ Made a voluntary donation of money e.g. to charities
- ☐ Contacted a T.D., public official or local representative

15. Approximately, how many organisations, clubs or associations are you a member of or associated with? (e.g. religious associations, sports groups, environmental associations)

☐

16. Please tick any of the following activities that you have participated in or have been affiliated with in the last 12 months and the frequency with which you have been affiliated with them?

	Once a year	A few times a year	Once a month	A few times a month	Once a week	A few times a week	Daily	Not applicable
Irish Farmers Association (IFA)	☐	☐	☐	☐	☐	☐	☐	☐
Macra na Feirme	☐	☐	☐	☐	☐	☐	☐	☐
Teagasc Meetings	☐	☐	☐	☐	☐	☐	☐	☐
Irish Cattle & Sheep Farmers Assoc (ICSA)	☐	☐	☐	☐	☐	☐	☐	☐
Irish Creamery Milk Suppliers Assoc (ICMSA).	☐	☐	☐	☐	☐	☐	☐	☐
Irish Countrywomen's Association (ICA)	☐	☐	☐	☐	☐	☐	☐	☐
The GAA	☐	☐	☐	☐	☐	☐	☐	☐
Rugby Football Union (RFU)	☐	☐	☐	☐	☐	☐	☐	☐
Youth Clubs (Foróige etc.)	☐	☐	☐	☐	☐	☐	☐	☐
Festival Organisation Committee	☐	☐	☐	☐	☐	☐	☐	☐
Royal National Lifeboat Institution (RNLI)	☐	☐	☐	☐	☐	☐	☐	☐
Tidy Towns Committee	☐	☐	☐	☐	☐	☐	☐	☐
Comhaltas Ceoltóirí Eireann (CCE)	☐	☐	☐	☐	☐	☐	☐	☐
Senior Citizen Community	☐	☐	☐	☐	☐	☐	☐	☐
Community Responder Programme	☐	☐	☐	☐	☐	☐	☐	☐
Community Alert Programme	☐	☐	☐	☐	☐	☐	☐	☐
Other *(Please specify)* _____	☐	☐	☐	☐	☐	☐	☐	☐
Other *(Please specify)* _____	☐	☐	☐	☐	☐	☐	☐	☐

17. Have you ever been part of a project to organise a new service in your area (e.g. youth club, defibrillator programme, recreation for the elderly)?

☐ Yes ☐ No

18. In general, how good would you say your;

Health is?	☐ Very Good	☐ Good	☐ Fair	☐ Poor	☐ Very Poor
Quality of life is?	☐ Very Good	☐ Good	☐ Fair	☐ Poor	☐ Very Poor

19. How satisfied are you with your present situation in the following areas in your life?
Using a scale of 1 to 6 could you indicate (√) your level of satisfaction with each of the following areas.

A '6' indicates that you are not satisfied at all while a '1' means that you are fully satisfied.

	Extremely Satisfied ←					→ Extremely Dissatisfied
Your work or main daily activity	☐6	☐5	☐4	☐3	☐2	☐1
Your financial situation	☐6	☐5	☐4	☐3	☐2	☐1
The amount of leisure time you have	☐6	☐5	☐4	☐3	☐2	☐1
Your life in general	☐6	☐5	☐4	☐3	☐2	☐1

20. In the past 4 weeks have you visited anyone in their home, apart from a family member or other relative, as part of a social visit or to provide them with some form of voluntary help or assistance in their home?

☐ Yes ☐ No

21. In the past 4 weeks has anyone visited you in your home, apart from a family member or other relative, as part of a social visit or to provide you with some form of voluntary help or assistance in your home?

☐ Yes ☐ No

22. Can you get help from friends when you need it?

☐ Yes ☐ No

23. In the last year, has there been times when you felt cut off or isolated from people or felt you couldn't socialise as much as you liked due to work & farm commitments, family responsibilities, transport problems, etc.?

☐ Yes ☐ No

24. Does your local community feel like home?

☐ Yes ☐ No

25. When you go shopping in your local area, are you likely to run into friends and acquaintances?

☐ Yes ☐ No

26. Generally speaking, would you say that in your area;

☐ Most people can be trusted ☐ You can never be too careful ☐ Don't know

27. Do you feel that the area in which you live is a safe place?

☐ Yes ☐ No

Thank you very much for taking the time to fill out this questionnaire. This is an anonymous questionnaire so you cannot be identified from the answers you give.

Have Your Say

If you wish, you are welcome to use this space to write down your thoughts and reflections on your own time-use, well-being and contribution to community life.

Household Questionnaire

1. How many people live in this household in total? ☐

2. How many of those living in the household are aged;

0 - 18	19 - 25	26 - 40	41 - 55	56 - 65	66 - 69	70 or older
☐	☐	☐	☐	☐	☐	☐

3. How long has your family been living/ farming in this area or community?

☐ 1 – 10 years ☐ 11 – 20 years ☐ 21 – 50 years ☐ 51 – 100 years ☐ Over 100 years

4. (i) Have you any plans to move from this address?

☐ Yes ☐ No

(ii) If yes; reason for move _____

_____

5. Which of the following would best describe the size of the community in which you live?

☐ Village of less than 500 people
☐ Village of 500 – 1,000 people
☐ Village of 1,000 – 1,500 people
☐ Town of 1,500 – 3,000 people
☐ Town of 3,000 – 10,000 people
☐ Town or City, 10,000 or more

6. What is the approximate distance from your household to the nearest village, town or urban centre?

☐ Miles ☐ Km ☐ Don't Know

7.

	ha	acres
(i) Total agricultural area owned? *(incl. woodlands, non-agri land)*	*ha*	*acres*
(ii) Land rented in?	*ha*	*acres*
(iii) Land rented/leased to others?	*ha*	*acres*
(iv) Land under woods & plantations?	*ha*	*acres*
(v) Unused agricultural land? *(inc. rough grazing)*	*ha*	*acres*
(vi) Non-agricultural land? *(inc. area under farmyards, farm buildings)*	*ha*	*acres*

8. Which of these best describes your predominant farming system?

☐ Specialist beef production
☐ Specialist sheep
☐ Specialist dairy
☐ Specialist tillage
☐ Mixed grazing livestock
☐ Other *(please specify)* _____

9. Do you employ any casual workers (non-family) to work on the farm?

☐ Yes ☐ No

10. (i) Do you have any other business(es) based on/at the farm *(e.g. agri-tourism, food processing, recreational activities, horticulture, etc.)*

☐ Yes ☐ No

(ii) If yes;

Type of Business	Years in operation

11. (i) Is there a potential heir to the farm in the household?

☐ Yes ☐ No

(ii) If yes; is the heir likely to take over the running of the farm in the next five years?

☐ Yes, full-time ☐ Yes, combined with another job ☐ No ☐ Don't know

(iii) If the operator is over 60 years with no heir or the heir is not likely to take over in next five years, what do you think will happen the farm in the longer term?

☐ Rented out ☐ Will be sold ☐ Will be under forestry

☐ Other (*please specify*) _____

12. (i) How much of a difference has the Single Farm Payment had on how you run your farm today, compared with the old subsidy system?

☐ None ☐ Slight ☐ Major

(ii) Please describe what has changed:

_____

_____

_____

13. In which of the following categories did the total gross (before taxes or deductions) **FARM income of your household fall in 2010?** (inc. grants & subsidies)

≤ €4,999	€5,000 - €9,999	€10,000 - €19,999	€20,000 - €29,999	€30,000 - €39,999	€40,000 - €49,999	€50,000 - €59,999	€60,000 - €69,999	€70,000 - €79,999	≥ €80,000
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

14. What proportion of your farm income comes from grants and subsidies inc. single farm payments and REPS?

☐ Less than 25% ☐ 26-50% ☐ 51-75% ☐ More than 76%

15. Over the last five years has your annual on-farm income

☐ Remained the same ☐ Increased ☐ Decreased

16. (i) Does your household have an off-farm income?

☐ Yes ☐ No

(ii) If yes; who works off-farm?

☐ Farm operator
☐ Spouse
☐ Other family member

(iii) If yes; in which of the following categories did the total gross (before taxes or deductions) **OFF-FARM income** of your household fall in **2010**?

≤ €4,999	€5,000 - €9,999	€10,000 - €19,999	€20,000 - €29,999	€30,000 - €39,999	€40,000 - €49,999	€50,000 - €59,999	€60,000 - €69,999	€70,000 - €79,999	≥ €80,000
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Appendix C

Pre-Notification and Cover Letters

24th May 2012

Time Use of Farm Household Members in the West of Ireland

Dear Householder,

The Irish Centre for Rural Transformation and Sustainability (ICERTS), The Department of Economics, National University of Ireland, Galway with the support of Teagasc, the IFA, the ICSA, the ICMSA and Tidy Towns Ireland are conducting research which examines the time allocation decisions of farm household members to farm and non-farm related activities. This research also attempts to identify the links between the farming and the rural community. The study of the time use of farm household members is important as it will provide important information for public policy programs that seek to improve the well-being of the rural population and promote rural sustainability.

Growing up on a small farm in the parish of Kilmihil, West Clare, I have always been aware of the diverse range of activities my father and mother allocate their time to. Both work on and off the farm but their work also extends to the neighbouring farms; a call in the middle of the night to help deliver a calf is not uncommon. In turn, our neighbours are 'roped in' whenever their help is needed on our farm or when my mother, who doesn't drive, needs a lift somewhere. It would be hard to imagine how rural Ireland could continue to operate in the way that it does without the kinds of relationships that members of farm households generate with their neighbours, family and community in general. Yet the number of farm households in Ireland fell by 17.8% in the past twenty years (from 170,600 in 1990 to 139,829 in 2011). The number of small farms declined rapidly (56% between 1990 and 2011), while there was an increase of 16% in the number of larger farms. The West of Ireland in particular has suffered a significant decrease in small farms with many families being left with no option but to leave the land, due in no small part to the financial pressures they are faced with.

Your household was chosen at random to receive this notification of the forthcoming survey. By taking the time to complete the time-use diary survey and accompanying questionnaire which you will receive in the post in the next seven days, your input will make an important contribution to the success of this study. The questionnaire is in two parts, the household questionnaire, which takes about ten minutes to complete and can be completed by any person in the household and the time-use diary, one each to be completed by the farm operator and their spouse/partner, parent, sibling or adult child. The diary takes about twenty minutes to complete at the end of each day, one a weekday and the other a weekend-day.

E-mail: s.keogh4@nuigalway.ie **Telephone**: (087) 6120954
Address: Discipline of Economics, NUI Galway, University Rd., Co. Galway

Participation in the survey is completely voluntary. However, for this research to have significance and make a difference, it is very important that farm households fill in the surveys. All of the information provided will be treated as **strictly confidential**. The information will only be used for this study and no individual details will be reported to any other organisation.

Please note that everyone who participates in the survey will be included in a draw for the following prizes:

1st € 100 Fuel Voucher
2nd € 75 Fuel Voucher
3rd € 50 Fuel Voucher

We hope after reading this letter that you are more aware of our intentions and that you will participate in the survey but if you do not wish to receive a survey or if you have any questions please do not hesitate to contact Sinéad Keogh at any time.

E-mail: s.keogh4@nuigalway.ie
Tel: (087) 6120954

Thank you in advance for your contribution.

Sinéad Keogh

31st May 2012

The Time Use of Farm Household Members in the West of Ireland

Dear Householder,

You should recently have received a letter informing you of this important research study. The study of the time use of farm household members is important as it will provide important information for public policy programs that seek to improve the well-being of the rural population and promote rural sustainability. By taking the time to complete the time use diary survey and accompanying household questionnaire, your input can make an important contribution to the success of this study.

Please find enclosed a household survey and two time use diaries. Attached to this letter is the household survey which takes about nine minutes to complete and can be completed by any person in the household. Also enclosed are two booklets, these are the time-use diary surveys, one each to be completed by the farm operator and their spouse/partner, parent, sibling or adult child living in the household with them. The diary takes about twenty minutes to complete at the end of each day, one a weekday and the other a weekend day.

While the diary looks complicated at first sight, on closer inspection it is straightforward. It would be of great help if the farm operator and their spouse/partner, parent, sibling or adult child each completed a dairy. The preferred days for which the diary should be completed are printed on the front of the diaries; these days can fall on any given week.

All of the information provided will be treated as **strictly confidential.** Information will only be used for this study and no individual details will be reported to any other organisation.

Please note that everyone who participates in the survey will be included in a draw for the following prizes:

1st €100 Fuel Voucher
2nd €75 Fuel Voucher
3rd €50 Fuel Voucher

We would be grateful if you could return the completed survey in the enclosed **prepaid addressed envelope** before **July 19th 2012 or at your earliest convenience.** Thank you in advance for your cooperation and contribution. If you have any questions please do not hesitate to contact Sinéad Keogh at any time;

E-mail: s.keogh4@nuigalway.ie or Tel: 087 6120954

Sinéad Keogh

E-mail: s.keogh4@nuigalway.ie **Telephone**: (087) 6120954
Address: Discipline of Economics, NUI Galway, University Rd., Co. Galway

Appendix D

Chapter 7 – Additional Information and Tables

Average Daily Duration of Activities by Men in Minutes by Age

Activity Group	Activity	Weekday					Weekend				
		All Persons					All Persons				
		18-25 yrs	26-40 yrs	41-60 yrs	61+ yrs	Sig.	18-25 yrs	26-40 yrs	41-60 yrs	61+ yrs	Sig.
Personal Care/ Resting	**Personal Care/ Resting/ Sleeping**	**610.0**	**547.9**	**560.7**	**643.9**	***	**425.0**	**607.9**	**606.0**	**667.9**	**
Travel	**Travel**	**90.0**	**36.2**	**33.1**	**24.2**	*	55.0	14.1	34.9	41.9	ns
Paid Employment or Study	**Paid Employment**	**0.0**	**315.0**	**176.0**	**15.6**	***	0.0	71.5	25.4	3.1	ns
	Study/ Education	0.0	**7.1**	0.9	0.0	ns	0.0	0.0	0.0	0.0	ns
	Breaks from Work/ Study	30.0	24.7	36.3	22.8	ns	10.0	34.4	29.8	20.1	ns
Farm Related Activities	**Planting/ Harvesting/ Picking/ Weeding**	65.0	47.6	39.2	7.5	ns	0.0	59.1	25.3	11.9	ns
	Farming of Animals	**130.0**	**119.1**	**208.6**	**251.7**	***	115.0	188.8	190.1	183.1	ns
	Farm Maintenance	**250.0**	**82.9**	**81.7**	**109.7**	**	90.0	88.2	66.7	37.1	ns
	Administration Related to Farming	10.0	12.4	11.6	13.1	ns	0.0	0.0	8.4	5.7	ns
	Non-Paid Activities Related to Farming	0.0	0.0	0.8	2.5	ns	0.0	0.0	1.8	4.5	ns
Housework & Other Household Tasks	**Cooking & Food Preparation**	5.0	30.0	18.2	25.0	ns	0.0	37.9	27.1	29.4	ns
	Housework	0.0	0.0	13.8	5.8	ns	0.0	13.2	8.9	11.0	ns
	Other Domestic Work inc. DIY, House Repairs etc.	0.0	5.3	16.5	12.8	ns	50.0	32.6	20.5	14.4	ns
Shopping & Appointment	**Shopping/ Errands/ Appointments**	5.0	6.2	13.5	28.3	ns	115.0	7.1	19.4	20.7	ns
Caring for Others	**Childcare**	0.0	25.6	8.9	2.5	ns	0.0	11.5	7.8	2.5	ns
	Caring for Adults	0.0	0.0	11.5	8.9	ns	0.0	0.0	8.9	10.5	ns
Voluntary	**Civic Activities**	0.0	0.0	11.6	11.4	ns	0.0	0.0	14.2	11.0	ns
	Informal Help to Other Households	0.0	0.0	11.6	23.1	ns	0.0	0.0	1.5	5.1	ns
Religious Activities	**Religious Activity**	0.0	0.0	2.9	3.1	ns	**0.0**	**7.1**	**32.8**	**42.2**	***
Socialising/ Communicating/ Going Out	**Spending Time/ Chatting with Family/ Friends/ Neighbours**	35.0	30.9	30.6	47.2	ns	50.0	38.8	48.8	80.4	ns
	Phoning/ Texting/ Family, Friends or Neighbours	0.0	3.5	5.2	7.8	ns	0.0	0.9	3.2	14.2	ns
	Eating Out/ Going Out	70.0	23.8	11.2	9.4	ns	**270.0**	**69.7**	**65.4**	**46.7**	*
Sports/ Exercise/ Leisure	**Playing Sports/ Physical Exercise**	40.0	24.7	6.6	8.3	ns	0.0	15.0	11.9	2.8	ns
	Productive Exercise	0.0	0.0	0.0	3.3	ns	0.0	8.8	1.2	1.7	ns
	Attending Sports Related Activities	0.0	0.0	5.1	1.1	ns	200.0	37.1	29.7	11.0	ns
	Computer/ Internet for Personal Use	20.0	5.3	4.1	4.7	ns	0.0	4.4	3.4	4.2	ns
	Hobbies/ Other Leisure Activities	0.0	3.5	2.6	4.4	ns	0.0	7.1	13.5	15.8	ns
TV/ Radio	**Watching TV/ Listening to the Radio**	80.0	81.2	98.6	115.0	ns	60.0	80.3	113.7	112.4	ns
	Reading	0.0	7.1	18.7	26.9	ns	0.0	4.4	19.0	28.6	ns
Other	**Other**	0.0	0.0	0.0	0.0	ns	0.0	0.0	0.6	0.0	ns

Average Daily Duration of Activities by Women in Minutes by Age

Activity Group	Activity	Weekday					Weekend				
		All Persons					All Persons				
		18-25 yrs	26-40 yrs	41-60 yrs	61+ yrs	Sig.	18-25 yrs	26-40 yrs	41-60 yrs	61+ yrs	Sig.
Personal Care/ Resting	**Personal Care/ Resting/ Sleeping**	**735.0**	**563.6**	**548.7**	**622.7**	*	420.0	666.4	624.3	660.0	ns
Travel	**Travel**	**150.0**	**92.1**	**37.5**	**27.7**	**	405.0	23.6	39.3	16.0	ns
Paid Employment or Study	**Paid Employment**	0.0	231.4	120.0	51.8	ns	0.0	87.9	15.0	0.0	ns
	Study/ Education	0.0	0.0	0.0	0.0	ns	0.0	0.0	0.6	0.5	ns
	Breaks from Work/ Study	45.0	23.6	16.2	10.0	ns	0.0	0.0	11.1	9.5	ns
Farm Related Activities	**Planting/ Harvesting/ Picking/ Weeding**	0.0	0.0	1.7	25.5	ns	0.0	0.0	3.0	5.0	ns
	Farming of Animals	0.0	23.6	36.6	82.3	ns	0.0	45.0	28.2	75.0	ns
	Farm Maintenance	0.0	0.0	0.6	13.2	ns	0.0	0.0	2.1	4.0	ns
	Administration Related to Farming	0.0	0.0	9.5	10.0	ns	0.0	8.6	3.6	2.0	ns
	Non-Paid Activities Related to Farming	0.0	0.0	0.9	0.5	ns	0.0	0.0	1.2	4.0	ns
Housework & Other Household Tasks	**Cooking & Food Preparation**	**0.0**	**15.0**	**106.2**	**88.2**	***	**0.0**	**55.7**	**138.3**	**101.0**	**
	Housework	75.0	102.9	119.1	100.5	ns	0.0	62.1	88.8	65.5	ns
	Other Domestic Work inc. DIY, House Repairs etc.	0.0	0.0	36.3	40.0	ns	0.0	0.0	15.9	22.5	ns
Shopping & Appointment	**Shopping/ Errands/ Appointments**	0.0	34.3	44.7	37.7	ns	165.0	40.7	60.3	39.5	ns
Caring for Others	**Childcare**	0.0	152.1	42.1	6.8	ns	0.0	182.1	14.7	35.5	ns
	Caring for Adults	0.0	0.0	41.3	7.3	ns	0.0	0.0	21.6	7.0	ns
Voluntary	**Civic Activities**	0.0	0.0	7.5	4.1	ns	0.0	0.0	14.7	5.5	ns
	Informal Help to Other Households	0.0	34.3	4.9	2.7	ns	0.0	0.0	4.2	5.0	ns
Religious Activities	**Religious Activity**	0.0	0.0	4.6	11.4	ns	**0.0**	**0.0**	**45.9**	**35.5**	**
Socialising/ Communicating/ Going Out	**Spending Time/ Chatting with Family/ Friends/ Neighbours**	210.0	68.6	38.4	31.4	ns	**180.0**	**30.0**	**79.2**	**53.5**	*
	Phoning/ Texting/ Family, Friends or Neighbours	15.0	4.3	10.7	13.6	ns	0.0	17.1	10.5	15.0	ns
	Eating Out/ Going Out	45.0	0.0	10.4	0.0	ns	0.0	45.0	35.4	9.5	ns
Sports/ Exercise/ Leisure	**Playing Sports/ Physical Exercise**	0.0	34.3	16.2	3.1	ns	0.0	8.6	21.9	25.0	ns
	Productive Exercise	0.0	0.0	0.0	3.6	ns	0.0	0.0	0.0	8.0	ns
	Attending Sports Related Activities	0.0	0.0	6.3	0.0	ns	0.0	0.0	12.0	12.0	ns
	Computer/ Internet for Personal Use	0.0	17.1	5.8	5.5	ns	0.0	0.0	12.9	5.5	ns
	Hobbies/ Other Leisure Activities	0.0	0.0	5.8	0.5	ns	270.0	17.1	15.6	22.5	ns
TV/ Radio	**Watching TV/ Listening to the Radio**	150.0	25.7	85.4	103.6	ns	0.0	111.4	89.4	134.5	ns
	Reading	15.0	17.1	24.8	40.5	ns	0.0	38.6	27.9	61.5	ns
Other	**Other**	0.0	0.0	2.6	2.7	ns	0.0	0.0	2.4	0.0	ns