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Assessing the Impact of Pensions Policy Reform in Ireland: the Case of Increasing the Pension Age

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Abstract

Although demographic ageing will affect Ireland later than many EU countries, by 2050 it will result in significant pressures on the public pension system. Recent reform in Ireland has attempted to address these pressures by increasing the incentive to save for retirement and by introducing partial funding for existing Pay As You Go (PAYG) public servant and state pension schemes. Attempts have also been made to improve the poverty effectiveness of public policy instruments. Although there have been substantial policy interventions to increase the labour supply of groups such as married women, lone parents and the long-term unemployed, there has been little emphasis on increasing the labour supply of older workers.

This paper uses a new dynamic microsimulation model to simulate life-course demographic and labour market histories for a cross-section of the Irish population. These simulated life-histories are then be used to simulate pension and other public policy at the micro-level for the Irish population. We use the model to assess the implications for budgetary and social policy objectives (poverty reduction and income smoothing) of raising the effective retirement age.

Keywords: Microsimulation, Fiscal Policy, Social Security, Income inequality

JEL Classification: C81, H23, H2, H55

1. Introduction

Ireland as in many other countries has a set of regulations and customs that result in a large proportion of the population retiring from the labour market on or before a set retirement age, in Ireland's case 65 or 66, with 15% of males and 3% of females aged 65+ participating in the labour market after this point.[2] Added to this, participation in the labour market has declined for younger age groups, with only just over 50% of males in the 60-65 age group participating in the labour market in 2002, down from over 70% 20 years previously. At the same time life-expectancy has been rising by about two years (life expectancy at birth) for both males and females in the 10 year period 1985-1995 and at levels below the EU average, is expected to continue to rise into the future.[3] Earlier retirement and longer life expectancy results in longer periods in retirement. Longer retirement will therefore clearly result in increased demands on support mechanisms such as public pensions and assistance for the elderly and for health and social care.

In addition to the current and future expected lengthening of the retirement period, demographic changes will result in a larger elderly population relative to the working age population, resulting in greater numbers of people in retirement, placing further pressures on public support mechanisms for the elderly.

At present, Ireland unlike many other countries in Western Europe currently still has a relatively young population, with about 40 per cent of the population aged 25 or under and only about 12 per cent of the population aged 65 or over. The proportion of elderly has remained relatively constant at about 10 per cent over the whole 20th century. Despite historically high birth rates, high levels of emigration has tended to offset this effect to keep the population constant or in fact falling over the period.

However the elderly, as a percentage of the population, is expected to increase in the future. Life expectancy at birth, has risen by on average 2 years a decade for men and

[2] CSO Statistical Year Book 2003.
[3] CSO Irish Life Table No. 13.

3 for women since WWII, with an increase of 2 years between 1985 and 1995. Official population projections assume that life expectancy will increase by about 1.5 years per decade into the middle of this century, with life expectancy projected to rise to 77.8 in 2031 for males and from 83.8 for females.

Fertility rates also have fallen significantly over time from a TFR peak of 4 in the mid 1960's to 1.89 in the mid-1990's. Although there has been a slight rise in fertility rates during the late 1990's economic boom, fertility rates in Ireland are high by EU standards and so are likely to fall or at least remain constant over time. The effect of this decline is to reduce the size of future working age cohorts and so combined with increasing life-expectancy, this will increase the size of the elderly population relative to the working age population posing further public finance pressures.

Counterbalancing the rising old age dependency ratio due to the changes in life expectancy and fertility, rising immigration will tend to lower the dependency ratio. However this effect is unlikely to be sufficient to stem the rising elderly dependency ratio.

Figure 1 describes the distribution of the Irish population by age group for 1961, 2002 and a forecast for 2050. The result of these assumptions is that the population will gradually rise by nearly 25 percent between 2002 and 2045, declining afterwards. Although fertility rates are below the long-term replacement rate, the number of births will rise as the large birth cohorts of the 1970's and 1980's have children. Forecasted immigration levels will also increase the population. However after this period the population will fall due to the lower fertility rate. The large dip in the 20-30 age group in 1961, deviating what one would expect to be a relatively concave curve, reflects the very high emigration levels of the 1950's and gave Ireland the highest old age dependency ratio in Europe in 1960. Conversely it is one of the reasons for such a small retirement age cohort in 2000. Emigration has been less important for succeeding generations, resulting in higher working age cohorts. Although significant improvements have been made in the child and young adult mortality rates, improvements in mortality amongst the elderly has not matched that in other countries

and thus longevity has not had much of an impact on the demographic structure thus far (Fahey and Fitzgerald, 1997).

Over the 1990's and into 2000, the elderly dependency ratio looks positive (see Figure 2). This is due to a number of factors. Firstly, the emigration in the 1950's from the 1920/30's birth cohort means that the generation entering retirement was small. Over the period 2000-2050 however, the picture is expected to change, with the proportion of 65+ expected to more than double and the proportion of the very old (80+) expecting to nearly triple. The reasons for this lie in factors that influence short-term trends and also due to the rapid drop in fertility since 1980. The numbers retiring will naturally rise as a result of larger cohorts reaching retirement. In addition this is coupled, with the dramatic reduction in birth rates since the 1970's. If this pattern of low birth rates does in fact continue, then large retiring cohorts will be accompanied by small and decreasing working cohorts. As a result we see that the elderly dependency rate is likely to double over the period 2000-2045.

1.1 Raising the Retirement Age

Pestieau (2003) argues that the incentives provided by the tax and social protection systems in OECD countries have created incentives to retire early. The higher the level of tax, the lower the marginal benefit of working is, increasing the incentive to retire. At the same time benefits typically do not vary with retirement age and so retiring later does not increase the value of the benefit. Social security and tax systems will therefore tend to distort retirement ages downwards. Rising incomes and the spread of private pension plans over time also create an income effect to retire early.

In Ireland, the official retirement age was 70 in 1961 falling to 65/66 to the period to the early 1970's and has remained at this level since. The old-age contributory pension is now payable at age 66, regardless of employment status. Ironically there is an incentive to retire at 65, as virtually an equally valuable pension is payable at 65 provided an individual leaves the labour market.[4] Also there has been an increase in early retirement rates and so the effective retirement age has fallen from 68.1 in 1960

[4] There is a commitment by the present government to abolish this anomaly.

to 63.4 in 2000 for males and from 70.8 to 60.1 for females (Pestieau, 2003); rates that are still high by EU standards.

Increasing the level of output of society is a policy that can reduce the burden of an ageing population that does not involve either reducing consumption per head by increasing the contributions of workers or by reducing benefits. This can be done either through increasing the size of the workforce or productivity levels or increasing the size of the workforce. Here, we consider one way of increasing the size of the workforce and simultaneously reducing the length of retirement, by increasing the effective retirement age.

Raising the retirement age, although fraught with political difficulties, is a policy frequently advocated to reduce the impact of the ageing of the population and earlier retirement ages. The impact of funding longer periods in retirement represents an increasing burden on workers. Barr (2001) argues that raising the state pension age should embody an endogenous retirement age, where the retirement age responds to changes in the life expectancy.

Implementing policies that increase the actual retirement age have a number of effects. Raising the retirement age simultaneously reduces the number of pensioners and increases the number of workers and imposing some of the cost of longevity on pensioners rather than workers. It improves the public finance position, increases economic growth because of a larger work force and is also likely to reduce income inequality and poverty.

Policies that can be used to increase the effective retirement age include:

- Raising the official retirement age itself seems the most logical first step. It increases the age at which pensions are paid. However across the OECD, there are not many examples of increasing the retirement age for men, other than bringing the retirement age above 60. The USA will increase the pension age from 65 to 67 over 25 years. A number of Nordic countries currently have retirement ages at 67. Mainly however, polices that have been implement have

been aimed at equalising retirement ages between men and women. Policies that increase the incentive for pensions to be deferred, receiving a increased pension may also help to increase the effective retirement age. While many of the countries have a limit of age 70, Finland, Sweden and the UK have or will remove this age limit.

Even if the official retirement age were increased, there is no guarantee that participation rates would increase very much as even at present the participation rate of those below the existing retirement age have decreased over time. Therefore, any attempt to increase the effective retirement age, would have to focus on policies that discourage early retirement.

- Reduce incentives provided by the public pension system to retire early by removing early-retirement provisions from the social security code. For example many Central and Eastern European countries have raised the age at which people can receive early retirement benefits. Italy and Germany have raised the number of contributions that need to have been paid before someone is entitled to these benefits, while Sweden has introduced actuarially based payment adjustments. Denmark has increased the use of active labour market policies, so that opportunities for training and rehabilitation are considered before entitlement to early retirement benefits are considered. In Ireland, possible reform may include the elimination of benefits such as the Pre-Retirement Allowance in Ireland and may include more stringent work tests and eligibility requirements for invalidity benefits.

- From an equity perspective, one may want to compare policies that increase the incentive to retire later across all groups in the population. Those with private pension plans will be more able to afford to retire earlier, so that later retirement may shift to those who cannot afford to early retire. Spreading the burden across the population, may require reducing the incentives to early-retire provided by private pensions by adjusting the tax favoured status of private pension plans to decrease these incentives.

- A parallel strand to reducing the pull factor from benefits and pensions to early retire is to increase the incentive to work itself by targeting work incentive policies at older workers. Examples include the use of in-work benefits/refundable tax-credits as in the UK, which increase the in-work incomes of low wage older workers, who may face the high work disincentives.

- Employers may be reluctant to hire older workers or to have early retirement schemes because of the perception that their skills may be obsolete and thus have lower productivity (OECD, 1996). Other measures that may increase the productivity of older workers, increasing their return from work is to enhance their skill levels by increasing active labour market and re-education/training policies for the older age groups to improve their abilities to participate in the labour market and improve their chances of being employed.

- Promote the use of productivity based wage increases rather than seniority rules in wage negotiation/bargaining processes. The use of seniority rules may result in old workers having wages higher than productivity levels, giving an incentive for organisations to employ younger workers.

- Use labour market legislation to remove labour market age discrimination and to increase the ease of flexible retirement and part-time work for older workers who may not wish to work full-time, but where custom and practice may prevent them from working part-time.

- Pay state pensions and pensions to civil servants at a later age. Significant proportions of employees work for the public sector, generally with generous pension schemes, often with earlier retirement ages than the official pension age. Hence the ageing of the population also has a public finance effect through the public sector pension bill. The same arguments that apply to public pensions for workers in all sectors apply to public sector workers.

- A potential policy solution to changing the retirement age, is to give workers the choice of retirement age, varying social insurance contributions, so as to allow workers to select higher contribution rates to be able to retire earlier. Given their discount rates, more individual's may choose to consume more in the short term and have lower social contribution rates and retire later.

If policies that aim to increase effective retirement were to be implemented then notice would have to be given well in advance. This is because individuals and firms need time to adjust their investment/savings behaviour in the spheres of education/training, saving/pension accumulation, house purchase etc. How long does the transition to higher retirement ages require? In the USA the transition of increasing the retirement age took 25 years.

OECD (1988) however present a number of potential problems with raising the state retirement age. If labour market conditions are more difficult for older workers perhaps because of the perceived gap between pay and productivity, then changing the official retirement age may not have much of a labour market outcome. Instead older individuals may move instead from being pensioners to being unemployed, with little impact on fiscal pressures. Improved training may increase their employment prospects. They also highlight the fact that although individuals are living longer, that it is not clear as to the extent to which they staying healthy for longer. In this case raising the state pension age may result in a shift from pension to disability benefits. Raising the state pension age will affect the poorest more as they will be less likely to have other savings or occupational pensions, resulting in these groups working longer. Simply raising the state pension age may therefore not increase the effective retirement age by much. Fields and Mitchell (1984) argue that raising the retirement age by two years may only result in a rise in the effective retirement age by 2 months.

In this paper, we consider trends in labour participation by older age groups and consider the implications for the state system for old age support through pensions and means tested benefits in Ireland. Utilising a microsimulation model we evaluate the cost and distributional implications of a change to the state retirement age. The paper is designed as follows. The next section describes the modelling approach used

to generate the lifetime panel dataset. Section 2 describes the Irish public and private systems of support for the elderly. Section 3 describes the main trends in the labour market. Section 4 presents an overview of the main methodology used in this paper, dynamic microsimulation. In Section 5, we report the results of our baseline simulation, while in section 6 we simulate the impact of increasing the effective retirement age. Section 7 concludes.

2. The Irish Pension System

The Irish pension system is in many respects typical of the Anglo-Liberal style of welfare state, with a relatively insignificant social insurance system, where means testing and progressive income taxes are more important. Public pensions and benefits are in general Pay-As-You-Go (PAYG). There are a number of important differences between the UK and Irish tax-benefit systems. Firstly means testing tends to be more important (See Evans et al., 2000). Social insurance is less well developed than in the UK, with benefits flat rate and with no earnings related components. Flat rate benefits tend to be of higher value than in the UK. Having a larger self-employed population, the coverage of social insurance also tends to be lower.

2.1 Old Age Insurance Pensions

The state insurance system for the elderly was established in 1961 and provides for three main pensions for the elderly; the old age contributory pension, the retirement pension and the survivor's pension. Combined, these instruments are the most important public pension/benefits both for elderly and for the population as a whole

Each pension is similar in design with payments being related to the number of (pay-related) contributions paid. Each has a personal rate, additional payments for any dependent children under 18 and a living alone allowance as well as an age allowance for the over 80's. The first two in addition also have additional payments for dependent adults.

A single person entitled to the maximum pension, on the average wage faced a replacement rate in 2002 of 33.1%, while a married couple faced a net replacement rate of 66.2% (O'Donoghue, 2004). Surviving spouses can receive a similar benefit called Survivor's Pension. Individuals without sufficient contributions paid before retirement at 65 who had been in receipt of the Invalidity Pensions continue to receive this.

Old Age Contributory Pensions were originally paid to those who were 70 years old or over. Between 1973 and 1977 this age limit was reduced to 66. It requires an average of 20 weekly contributions per year to get the minimum pension. The Retirement Pension has similar conditions but is available to insured over 65's who have retired from full time work. About two thirds of recipients receive the maximum rate.

Survivor's contributory benefits are paid to survivor's after their spouses death if either spouse are insured. Again the pension depends upon the number of years of contribution, however 90% recipients get the maximum pensions.

2.2 Social Insurance Contributions

The coverage of the social insurance system has expanded substantially since the 1950's (See O'Donoghue, 2004). Initially full coverage was limited only to full-time private sector employees, with partial coverage of public sector workers. In addition until the 1970's, non-manual workers earning more than the contribution ceiling were excluded from membership of the social insurance scheme. This resulted in 1955 in a situation with coverage for only about 60 per cent of the work force, with full coverage for just over half (Hughes, 1985). Over time, the proportion of the work force in private sector non self-employed employment has increased, resulting in a gradual increase in the insured population. By 1973 73 per cent of the population were coverage. A number of further structural reforms have resulted in increased coverage. In 1974, the contribution limit was lifted for non-manual workers, increasing total coverage to nearly 85 per cent in 1975. The main effect of this reform was to nearly double the coverage for partial benefits within the public sector. Recent

structural reforms have further increased coverage, including the extension of partial cover to the self-employed with earnings over a threshold in 1988. Part-time workers were included in the system in 1991. New public sector workers from 1995 are covered for all benefits. In recent years, the dominant force in the expansion in the numbers covered by the social insurance system has been demographic and economic as both the working age population and the labour force has increased dramatically in size. This is witnessed by the doubling of the insured population in the years, 1980-1998 and the continued increase to 2002.

Despite these reforms, until recently there had been a number of significant gaps in coverage. In 1998, only 75 per cent of those covered were covered for all benefits, with the rest being made up of self-employed, low-wage workers and existing public sector workers. Also there had been a number of groups completely excluded from coverage. Those within the labour market excluded from membership include those earning less than the contributory threshold, the self-employed in receipt of unemployment assistance, some participants on social employment programs and relatives assisting self-employed.

Contributions are credited automatically for claimants of Unemployment, Disability and Maternity Benefits and Invalidity and Retirement Pensions. Recipients of Unemployment Assistance, Pre-Retirement Allowance, Injury Benefit, Carer's Allowance, while participating in a Back to Education Programme or on a state training courses must have worked and paid at least 1 PRSI contribution in either of the previous two complete income tax years before making the claim. Students who have paid insurance contributions before entering University are also received for periods in education.

Contributions have moved from flat rate payments, which existed until 1978 to firstly a partially earnings related system in 1974, to a wholly earnings related contributory system in 1979, *Pay-Related Social Insurance* (PRSI). Total contributions are divided between employee and employer contributions that are paid into the social insurance fund and income levies paid into general taxation. PRSI is paid by workers on earnings up to a ceiling subject to an allowance that varies for different types of

workers. Income over the ceiling faces a marginal rate of zero. Employer contributions (ERSIC) for employees have a similar structure except for employees with earnings below the ERSIC reduced rate limit who face a lower ERSIC rate. Flat rate Health Contribution Levies, Education and Training Levies are also paid by individuals who have earnings above an exemption limit. This movement from flat rate benefits and contributions to flat rate benefits and earnings related benefits, combined with a limited linkage between contributions and benefits, have resulted in a social insurance pension system thus is highly redistributive, reducing the pure insurance element of the system.

2.3 Means Tested Social Assistance Benefits[5]

For those ineligible for contributory pensions, there are corresponding means-tested benefits available. These benefits are typically lower valued than the contributory based instruments and in 2002, a single person entitled to the maximum pension, on the average wage faced a replacement rate of 27.2%, while a married couple faced a net replacement rate of 53.4% (O'Donoghue, 2004). The pre-retirement allowance is paid to those aged 55 or over, who had been in receipt of unemployment benefits for 15 months and who retire from the labour market.

2.4 Indexation

Figure 4, describes the trend in the net replacement rate from 1955-2002. For single persons, replacement rates in general are quite low by European standards, with the replacement rate never reaching 40%,with the lowest replacement rate being just over 10% in 1955. From 1955-1965, we observe a fall in the replacement rate. This is because single person benefits in general fell with respect to net average earnings. The replacement ratio rose from 1965 to 1987, and is partly due to rising benefit levels and partly due to higher taxation, which reduces the denominator, net average earnings.

[5] There are additional benefits which elderly individuals can claim. All individuals over the age of 66 receive free travel. Those who live alone or with dependants and reliant on social welfare payments, are entitled to free television licences, allowances for free telephone rental, free electricity, fuel and up to a maximum. Poor households can also claim means-tested assistance with their housing costs.

Since 1987, falling taxation and benefit levels has resulted in higher denominators and lower numerators, pushing replacement rates down. During this period resources were used to narrow the differential between benefit rates, so that the lowest benefit rates such as short-term unemployment benefits were increased in value relative to the more generous old age benefits. Because of this and also because of the general indexation policy, benefits between 1987 and 1998 have fallen further behind earnings, despite rapid economic growth. Between 1998 and 2002, this trend has largely reversed, improving the replacement ratio, however with indexation being at the discretion of the government and thus strongly dependent upon the state of the public finances, in the periods of lower growth, benefit replacement rates may fall further.

2.5 Number of Recipients of Public Pensions

In table 1, we report the number of recipients of the different public pensions available in Ireland. While for much of the period, the old-age non-contributory (means-tested) pension, has the highest number of recipients, it disguises the fact that most recipients are get social insurance based pensions, rising from about 60% of all recipients in 1992 to 71% in 2001 as a result of the increase in size of the insured population. Although remaining relatively constant as a percentage of all benefits, the proportion of recipients of survivor's contributory pension has the highest level of receipt by 2001. The means-tested old age non-contributory pension has the biggest fall in percentage of recipients, falling from 31% to 22.2%. This is explained by the fact that more elderly are becoming eligible for insurance pensions, as witnessed by the fact that biggest increase in recipients however occurs in the contributory old age and retirement pensions which rose from 35% of recipients in 1992 to 44% in 2001.

2.6 Cost of State Pensions

In figure 5, we report trends and projections of old age and survivor's insurance and assistance benefit expenditure, 1955-2060. The demographic assumptions under-lying the projections are the same as in figure 3. Three alternative indexing assumptions are made. The first scenario assumes that all incomes rise at the rate of productivity

growth. The second set of assumptions is based upon indexing assumptions based upon a long-term forecasting paper of the Department of Finance outlined in Box 1. The third assumption corresponds to a proposal of the Working Group on Benchmarking and Indexation that the lowest valued benefits should increase to 27% of the Average Industrial Wage (Gross), equivalent to a percentage increase in 2000 of 20% and that other benefits be increased proportionally. Thereafter it is assumed that benefits increase at the rate of productivity growth.

Box 1. Department of Finance (DoF) Projection Assumptions

Social Insurance Contributions increase at 80 per cent of the rate of productivity growth. As a result, revenues will tend to fall slightly relative to average income over time.
Social Welfare benefits per recipient will rise at 1 per cent above the rate of inflation. As this is below the growth rate, it will have the effect of a falling replacement rate over time and as a result will cause benefits to fall relative to earnings.
All other incomes increase at the rate of productivity growth.

Source: Department of Finance (1998).

We see that over the early years of the state, expenditure grew relatively slowly from about 1.5% of GNP in 1922 to 2.5% in 1960. After this period however, old age support as a percentage of GNP rose to a peak of a 6% in 1987. Although as we saw in figure 2, the percentage of the population aged 65+ rose only slightly (in fact the elderly dependency rate fell – figure 3), we see in figure 4, that the introduction of insurance pensions and rapid rise of the replacement rate had the biggest influence on the rise in expenditure. Between 1987 and 2000, expenditure fell to 3%. Part of the reason is the decline in elderly dependency rate that resulted from a relatively small retirement cohort (figure 3) and also due to the decline in the replacement rate seen in figure 4.

2.7 Reform Issues: Public Pensions

Reforms to the public pensions system over the late 1990's to early 21st century have focused on widening coverage, introducing a funded element to the system and to reduce the disincentives to save within the system.

Participation rates, especially for women due to home responsibilities and young people due to participation in the labour market, are low relatively. Until 1994, unlike in countries such as Britain and Germany, their contribution to society was not recognised within the social insurance system, However since 1994, carers of children aged under 6 and since 1995 aged under 12 or incapacitated, have the number of contributory years required to be eligible for a pension, reduced by up to a maximum of 20 years when calculating long term benefits. This policy is similar to Home Responsibilities Protection (HRP) in the UK.[6]

Because of the concerns raised above about the future increase in public pension expenditures, the National Pensions Reserve Fund Act 2000 established a national pensions fund to help finance both public pensions and public service occupational pensions. Each year, at least 1 per cent of GNP will be deposited in the fund between 2001 and 2055. From 2025 the exchequer will be able to draw down monies from the fund to finance expenditures on public pensions and on the occupational pensions of public sector workers.

Recent policies have also focused on disincentives to save within the means-tested component of the system. The system now allows substantially higher levels of assets to be exempt from means-testing and has restructured the imputed interest rate on assets.

A proposed policy, although as yet not implemented is the abolition of the requirement to retire to receive the retirement pension at 65. There are no current plans to allow for deferred rights.

2.8 Private Provision

Ireland like other Anglo-liberal countries such as the UK, New Zealand and Australia places an important emphasis on private provision in supporting pensioners in

[6] HRP is however more generous in that carers can get credited contributions as long as they are in receipt of child benefit payable to families with children aged 16 or under or in secondary education up to the age of 18.

retirement. Private Provision consists of two types of pension, occupational pension plans that are usually linked to employment in a particular industry or employer and personal pension plans that are tied to an individual.

Occupational pension schemes can be broken up into two types, those that are guaranteed by the state, covering employees in the public sectors and those provided by firms in the private sector. The public sector schemes were the first to evolve and cover occupations such as civil servants, police, armed services, teachers, health workers and also employees of state enterprises such as electricity and transport workers etc. These schemes have virtually universal coverage across the civil service. Private sector pension schemes on the other hand are much newer, with only 6% of current schemes existing in 1960 and have a relatively lower coverage (Keogh and Whelan, 1985).

After a period of increasing coverage of occupational pensions, ESRI surveys in 1995 found that 52% of the employed workforce was covered by occupational schemes, down from 54.4% 1985, but up from 35.6% in 1974. Recent Statistical Office figures indicate that the percentage of employees with an occupation pension has fallen to about 46.9%. The numbers in employment are however much larger and so more of the population are covered.

Firm level pensions tend to be defined benefit, with contributions being actuarially calculated to meet the liabilities of the scheme. Firms usually pay all or some of the contributions. Defined benefit pensions have the advantage of giving workers stable expectations of their retirement earnings and are concentrated amongst full-time workers, especially in the public service. In 1992, about 12% of occupational pension members were covered by defined contribution pension schemes (National Pensions Board, 1993). By 1995 this percentage had increased to 17% as employers shift pension risk to their employees (Hughes and Whelan, 1996).

Personal pensions are similar to defined contribution schemes in that the pension risk is held by the individual. These are usually held by self-employed or by individuals whose firm does not have an occupational scheme. Increasingly as the labour market

becomes more flexible more employees are saving in personal pension plans. They have the advantage of being mobile in that in moving between jobs, individuals can easily bring their pension with them. In addition ownership of the fund is unambiguous and individuals can set their own retirement age. Like defined contribution schemes, pension risk is held by the individual.

In table 2, we describe the coverage of occupational and personal pension coverage in the Irish labour market in 2002. The table reports the percentage of each age-group in the different categories employee/self-employed, with occupational pensions/personal and occupational pensions/no-pensions. For men the coverage rate of any type of pension rises to a peak of 67% in the 45-55 age group, while for women, indicating the relative later expansion of women's employment the peak is lower and early at 52% in the 35-45 age group. Coverage is higher for males than females, 56% of males in the labour force aged 20-65 having some form of pension compared with 44% of females. Coverage rates are higher for employees than the self-employed with 59% (56%) of male (female) employees covered by pensions, compared with 48% (31%) of the self-employed. As a result the total coverage rate for the labour market including both employees and the self-employed is 55.8% of males and 44.3% of females, 51% in total.

2.9 Reform Issues: Private Pensions

Recent reform of private pensions has attempted to increase the coverage of personal pensions, and encouraging saving by increasing tax-relief.

An initiative designed to increase the coverage of private pensions was the introduction in 2002, the Personal Retirement Savings Accounts (PRSA). These are individual pension savings accounts with the same tax favoured status as occupational pensions. They are fully portable and so can facilitate ease of movement between different employments and are regulated so that firms must offer them to employees, that fees are limited to 5% of contributions or 1% of assets and that transfers between funds are not penalised.

Because individuals on average take-up private pensions plans relatively late in life, the tax system has been adjusted to provide an incentive to invest more in pensions at later ages. From a position where 15% of earnings could benefit from tax-relief for all ages, now the percentage of earnings that attracts tax relief has increased to 20% for the 30-39 age group, 25% for the 40-49 age group and 30% of earnings for the 50+ age-group.

3. Trends in the Irish Labour Market

In this section, we describe the changing labour market situation in Ireland. Figure 6 reports the labour force participation rate by gender and age-group during the period 1975-2002. While prime age male participation rates have fallen slightly over the period, participation rates of older males (55+) have fallen substantially. The participation rate of the 55-59 age group has fallen by 15%, that of the 60-64 age group has fallen 30% and for the 65+ age group, the fall has been nearly 50% over the period. For women, there has been a very different trend. Employment rates for younger women have converged rapidly towards male levels. The trend exhibits cohort effects as the rise in age-specific participation rates started for younger ages before that of older ages.

We notice that for both males and females, there is a large difference in the employment rates of 60-64 and 65+ age groups. The large fall in the participation rate indicates that although the decline in the participation rate before the official retirement age is important, the official retirement age still has an effect.

This can be seen in more detail if we examine the participation rate for single age years. In order to highlight the impact of official retirement age on retirement, we compare the participation rates of employees with the self-employed for single year age groups. Tables 3a and 3b report for males and females respectively the rate as a percentage of the age group of (a) those in work, (b) those in employment (c) those in full-time employment and (d) those in self-employment for those aged 54-74. We notice that the decline with age in the percentage of individuals who are self-

employed is much flatter than for the decline for employees. In the case of males, the percentage of 74 year olds self-employed at age 74 is 55% of the rate at 54, while for employees it is about 6%. The biggest proportional year on year fall in the employment rate is the year after the old age pension age at 66, where the percentage of 66 year olds in employment is nearly 60% less than the percentage of 65 year olds. The percentage of those in self-employment actually increases at this age. Before this age, the decline is much more accentuated for employees than self-employed, with the percentage of 65 year olds in employment being only 40% of the rate of 54 year olds, compared to 98% for the self-employed.

What might explain this difference? The self-employed are more likely to be able to choose when they retire than employees. The self-employed will have more control over their retirement decision than employees, who may have to retire at set retirement ages. The self-employed are not eligible for the state retirement pension at 65, which requires an individual to retire from work, rather they only become eligible for the old age pension at 66, which has no retirement requirement. Therefore this may provide some evidence that individuals who have more power over the retirement age such as the self-employed, may retire later than if facing the constraints that employees may.

However this may merely be a selection issue and that those who are more likely to retire later are more likely to be self-employed. Also the self-employed are less likely to have private pension provision and so are less likely to be able to retire earlier. We see in table 2 that for both employees and self-employed, the peak age for holding private pensions is in the 45-55 age group. While about 75% of employees hold private pensions at this age, only about 55% of the self-employed hold them. For both male employees and self-employed, this rate declines by about 10-15% for the 55-64 age group and by about 40% more for he 65+. This indicates that those with pensions are more likely to early retire than those without pensions. This may also indicate that the likelihood of retiring early or at the retirement age for both employees and self-employed is similar, conditional on holding a pension.

4. Methodology

4.1 Dynamic Microsimulatio

In this paper we are interested in examining the impact of a change in retirement ages. In particular we are interested in the impact of this change on public pensions. In order to assess the impact of a policy change, we need information about pensions before and after the policy change. For this reason the policy has to be simulated. Because pensions rules are quite complex, it is necessary to use micro-data to simulate these policies. Also because pensions require information about work-histories, we need quite long running panel data. Long-running panel surveys only exist in a small number of countries such as USA, Germany or Sweden. However even these surveys are not sufficiently long-running to simulate pensions. The longest such panel available in Ireland is only 8 years long. Therefore in order to analyse the impact of such a policy reform, we need to simulate both the policy reform and the data on which the reform is analysed. We therefore use a dynamic microsimulation model.

Dynamic microsimulation, is a method that synthetically simulates panel data and involves simulating over a lifetime or period of time, components that influence the lifetime distribution of income such as mortality, earnings patterns, retirement decisions etc. This field has existed for over thirty years (See Orcutt et al, 1961), but however initially, the perceived benefits did not outweigh the very high costs of development and as a result dynamic microsimulation models were only built in a very small number of countries (USA and Germany). However over the last 10 years the field has expanded as computing costs decrease and as the availability of micro-data increased. So far about 30 dynamic microsimulation models have been constructed internationally (See O'Donoghue, (2001) for a survey), with approximately 10 in active use at present.

Microsimulation models incorporate behaviour in a less comprehensive manner, than other models such as overlapping generations models (OGM) that have production sectors and models of sectoral interactions. OGM's too can examine similar inter-

temporal public finance issues as dynamic microsimulation models and furthermore can take into consideration, general equilibrium effects of public policy. However OGM's lack the detail of microsimulation models and so are less able to incorporate the rules of tax-benefit systems.

The limited behavioural processes included in dynamic microsimulation models depend strongly on the micro-behavioural econometric studies and household datasets on which they are based. At present there exist many knowledge gaps about the micro-economic behaviour of individuals and families both internationally and in Ireland. Internationally, the *Panel on Retirement Income Modelling* (Citro and Hanushek, 1997) in the USA highlights for example, that the life-cycle model of savings and consumption does not adequately explain long run changes in personal savings behaviour. Also life-course labour supply and retirement behaviour is not well understood. In Ireland many gaps exist such as the economic determinants of demographic behaviour, empirical models of savings and wealth accumulation behaviour or earnings mobility.

The absence of good datasets also limits the development of the field. In most countries of Europe at present, only 8 waves of the *European Community Household Panel* are available, limiting the quantification of dynamic behaviour. Such short panel datasets will also be less able to disentangle the impact of age, cohort and period effects.

Given these limitations it might be argued that one should wait until these deficiencies are corrected before embarking on such an ambitious project as creating a microsimulation model. However, as Burtless (1996) points out *microsimulation provides an organising framework*. In other words, the existence of a dynamic microsimulation model forces model developers to think about the interactions between behavioural processes rather than focusing purely on specific issues or single dimensions of multi-dimensional decisions. In this way they help to identify knowledge and data gaps and help to create an agenda for filling them.

Dynamic microsimulation models can be divided into two types, population and cohort models (see Harding, 1993). Both types of model simulate for individual agents, life histories of processes such as education, fertility, marriage, labour market behaviour and detailed government policies. There is a computational trade-off between simulating many cohorts and simulating many years. Historically, dynamic population models opted to simulate many cohorts over the medium term of say 20-40 years. Dynamic cohort models on the other hand opted to simulate single cohorts over an entire lifetime. However recently as computational costs have come down, this is less of an issue.

The two models also have been used to examine different issues. Dynamic population models project forward the characteristics of a population cross-section over a number of years into the future. They take a set of underlying assumptions about the way behaviour will change over time. As a result they produce a forecast of the population at some point in the future and so in ways they are analogous to the forecasts by medium and long-term macro models. Projecting information necessary to simulate long-term policy issues such as pensions and long-term care, they can be used to examine the effect of demographic and economic changes on existing policy and also to design alternative policy instruments (See, Caldwell et al., 1999).

Dynamic cohort models on the other hand, tend to make steady state assumptions, assuming that behaviour is unchanging over time, for example behaviour as observed in the mid-1990's. They then typically take a single tax-benefit system and carry out analysis on it in a steady state. (See Harding, 1993; Falkingham and Hills, 1995 and Baldini, 1997). They therefore represent no cohort. Focusing on just one system and utilising unchanging behaviour patterns they allow one to look at the actual forces within a particular tax-benefit system that drive lifetime redistribution results without considering potential compensating interactions.

4.2 Model Description

The model used in this paper is described in more detail in O'Donoghue (2001) and can be characterised as a dynamic steady state cohort model. The model simulates a

range of life-cycle processes, demographic, labour market, education and occupational pension behaviour. The model also simulates the Irish tax-benefit system in detail.[7]

Labour market behaviour equations are estimated using the 1994 *Living in Ireland Survey,* a 4000 household income survey, part of the European Community Panel Survey, described in Callan et al. (1996). Transitions were estimated using recall data from 1993 and current information from 1994. In the future, access to further waves of the panel will improve the model estimates. Most demographic processes such as mortality, fertility and education are estimated using official statistics.

In order to generate the correct life-cycle distribution of age and births, the main demographic processes, education, fertility, disability, marriage and mortality are simulated. While these characteristics depend primarily on age, marital status and gender, own and parental occupation and education levels are also important determinants. Because of the recent volatility in migration flows we assume no migration in the current model. Marriage is simulated by first selecting individuals in the model to marry and then by utilising a matching algorithm, potential partners are selected from the population.

The labour market process is hierarchical. Firstly those who are in education or become disabled are excluded from labour market participation. Secondly, a decision is made whether an individual retires from the labour market. This process is influenced by whether an individual suffers long-term illness or periods of long term unemployment late in life and membership of a private pension plan. A simulation is then carried out on the remaining group to determine whether they will enter the labour market or not.[8] As long periods out of work will reduce the chances of entering work, duration variables are included. Likewise, lack of formal child-care support and lone parenthood in Ireland will have an impact on the decision.

[7] Because there are a number of hundred behavioural equations, we do not report these results here. (See O'Donoghue 2001).

[8] On leaving school, a separate process to the main labour market module is used to determine whether an individual enters the labour market. This is because transitions at this stage in the life-cycle tend to be different to other people entering the labour market from non-participation.

Even when one includes these influences on the decision to work, there is a great deal of heterogeneity and thus the model is likely to produce too much career mobility. To partially limit the effect of this, we construct the notion of those in regular and marginal employment (See Atkinson and Micklewright, 1991). Membership of a pension plan or public sector employment, together with an individual's labour market position in the previous period and a generated measure of permanence[9] is used to determine regular/marginal employment.

If an individual is determined as being in work in a period, the model then simulates whether that individual becomes an employee or opts for self-employment. Employees have a choice between two discrete labour supply states, part time or full-time work. The self-employed have the choice between agricultural and non-agricultural employment. Individual's employment decisions in the past have a strong bearing on their current decision.

The model incorporates in a relatively simple way the influence of the tax-benefit system on labour market behaviour. Individuals optimise behaviour based on tax-benefit outcomes when deciding to work or not, when deciding to work full-time or part-time, when deciding to become self-employed and when choosing to seek work if out of work. We must note that this behaviour does not incorporate a life-cycle dimension and so changes in future pension entitlement due to the retirement age changes will not be captured in the decision-making. We therefore have to make assumptions about likely changes in behaviour.

It would be desirable to simulate a model of savings and consumption behaviour with wealth accumulation and investment returns. Because of data problems, we instead however, employ a simpler model where only investment, property income and consumption are simulated.[10] Lastly, taxes and benefits are simulated using the EUROMOD tax-benefit model (See Immervoll and O'Donoghue, 2001), which

[9] This measure is generated from information in the LII survey regarding the proportion of time since leaving education spent out of work.

[10] Blomquist, (1981) argues that as capital income is a return on savings, one should not include this in the lifetime income concept. However, as a source of income it is important to consider when comparing standards of living.

contains detailed rules of the Irish tax-benefit system together with additional modules for social insurance benefits.

A method known as alignment is used to calibrate aggregates simulated by the model with external control totals. This allows macro-economic conditions to be incorporated exogenously in the model and thus alignment contains the forecast assumptions for the simulations.

4.3 Validation

In order to validate outcomes simulated by the model, we compare life-cycle employment rates simulated by the dynamic microsimulation model with actual employment rates for the population as a whole taken from a cross-section in the 1994 *Living in Ireland Survey*. Table 1 describes the employment rate for individuals with different educational qualifications over the life-course. When we compare simple average employment rates, we find that employment rates are much higher for the simulated cohort for each age group than for the total population in 1994. However when one decomposes by the employment rates for different educational attainment groups, we find that employment rates are much closer.[11] The upward shift in the overall employment rates result from the compositional change in the distribution of education levels in the population. In the last column, we can see the proportion of the simulated and 1994 populations with different education levels. We see that while in 1994 only 9(8) per cent of males (females) had third level education, taking education participation rates of the mid-late 1990's we find that 39.5 (49.5) percent of the simulated cohort have third level education. This is due to the large increase in education participation in the mid/late 1990's on which the simulated transitions are based. This is especially noticeable for older age groups and for women where this differential is greatest.[12]

[11] One must be cautious about conclusions drawn for the population whose highest education level is lower secondary as the numbers involved are very small.

[12] Even for the 20-30 age group, the employment rate is slightly higher for the simulated cohort than for the 1994 population due to graduate employment rates improving dramatically over the mid 1990's.

Table 1 validates the cross-sectional employment rates for different age groups. In table 2 we consider the validity of the longitudinal simulations. Here we report the distribution of males and females by the number of years spent out of work between leaving education and entering retirement. We notice that, like the employment rate, the distribution of years out of work is highly related to education level. Comparing the simulated cohort with the actual population, we find that the distribution is quite similar for each education level to that observed in the population. In the 1994 data, for men we consider the percentage without any employment gaps in the 55-65 age group. Older women even when accounting for different education levels have had much lower employment rates than for younger women. As a result a lower proportion of the 55-65 age group will have no years out of the labour market than for younger women. Because we assume that the behaviour of women is based on an extrapolation of current trends of younger women, it is more appropriate to compare the outputs of the model against the employment persistence of younger women. We therefore look at the proportion of women aged 30-35 who have spent no years out of work as our comparator.

In Table 3 we consider the variability of disposable and market incomes as measured by the Gini coefficient (for a description, see below) and the degree of redistribution as measured by the Reynolds-Smolensky index (with reranking). As expected, because of the inequality reducing effect of public policy, disposable income for all income concepts is less variable than market income. We also see that lifetime incomes are less variable than annual incomes (market – 0.45 vs. 0.54; disposable – 0.35 vs. 0.41). This is due to the impact of income mobility over the life-course.

Redistribution is higher when measured over a year as compared with a lifetime (0.13 – 0.10). This is indicative of the importance of intra-personal redistribution and is consistent with the influence of mobility within the lifetime that results in individuals who pay taxes at one point and receive benefits at another point in the life-cycle. Income variability is higher and redistribution of the tax-benefit system is lower when lifetime incomes are annualised than when lifetime is considered unannualised.

As an additional source of validation for the model, we compare the variability of simulated annual income with the variability of current income found in the data in 1994.[13] While the variability of market incomes is similar (0.54 – 0.54), disposable incomes are much more variable for the simulated cohort than for the 1994 household population (0.41 – 0.34).

The difference between the simulated data and the survey data can be partially explained by the fact that in the simulated data, individuals are grouped into a narrower family unit, ignoring other household members. The survey-based measures meanwhile consider the wider household as the unit of analysis. As household sizes in Ireland are the largest in the European Union due to the presence of other *non-dependent* individuals[14], it is likely to have a strong effect on the Gini-based measures used here.

Comparing the variability of incomes in the data when individuals are grouped into families, we see that the variability of both market and disposable incomes are higher, with data based disposable income variability being similar to the simulated variability (0.41 – 0.42). However the variability of market income is now quite different (0.54 – 0.62). However as highlighted above, the simulated cohort has a very different population to the 1994 cross-section. Higher levels of education and improved economic circumstances result in more of the population in work in the simulated cohort than in the population cross-section. To try to make the simulated cohort more compatible with the 1994 data, we reweight the simulated cohort so that the education distribution is the same as that of the 1994 population. When we do this, we see that the variability of market (0.65 – 0.62) and disposable incomes (0.44 – 0.42) are broadly comparable in the simulated and survey data.[15]

4.3 Cohort to Cross-Section

[13] Note that we update the 1994 market incomes to 1998 and then simulate the 1998 tax-benefit system.
[14] Individuals that are not married to the head of household or dependent children.
[15] The results were found to be robust to different assumptions about the definition of equivalence scales.

The dynamic microsimulation model we use, simulates a single cohort of the population with behaviour as characterised by the population in the mid-1990's. In order to assess the impact of a change in retirement age, we would ideally like to consider what happens to a representative sample of the population over time. In essence we would ideally use a dynamic population microsimulation model, a model that represents cross-sections of the population. However as such a model is being developed at the moment and not available for policy analysis, we try to adapt our existing model to suit our purposes.

We use the model to simulate alternative cohorts one by one. As in the case of dynamic population models, we make the assumption that behavioural characteristics of each cohort are similar. In other words we assume that the only difference in behaviour between cohorts is compositional. We allow cohorts to vary compositionally in a number of ways:

(a) Size. Different birth cohorts have different sizes. This difference is incorporated through re-weighting.

(b) Education. Generations retiring in the period before 2045, will largely have completed their education. Therefore we allow different cohorts to have different levels of educational attainment as observed in the distribution educational achievement observed for different cohorts in 2000. In this exercise we focus on the period to 2050, making the assumption that later cohorts have the same education participation rates as recent school leaving cohorts. This is not an unreasonable assumption as school completion and university attendance rates although having increased in the period to 1995, but have remained relatively constant since then. Assuming that education levels remain constant after the early 20's however assumes that life-long learning policies don't change. If this were to happen then education composition would change in the future.

(c) Mortality. Life expectancy as we have shown has increased over time. We later birth cohorts to have a rising life-expectancy.

As we have shown in the validation exercise, differences in the education composition can explain a large degree of inter-cohort variability of incomes. Therefore we can be hopeful that this relationship holds into the future.

The policy environment that has been simulated is 1998. Between 1998 and 2003, there have been relatively minor changes to the structure of the tax-benefit system. Also as the current pension system was introduced in 1961, most of the retired population will be covered by the current legislation. One potential problem area is the fact that we are assuming the social insurance contribution policy has been the same for all retirees. The system moved from a flat-rate system in the 1970's to a pay-related one. However as pensions require only the number of weeks of contributions and not the value of them or when they were paid, it is less of an issue. We are likely to overestimate coverage by the system of retired civil servants and self-employed are less likely to be members of the social insurance system than new retirees. However the reform looks at the implication of a delayed retirement age for new retirees, so this is less of an issue.

In table 7 we report the educational composition of the population over time as a validation check. We notice the impact of the rise in education levels over time as the proportion of university educated rises from the smallest group in the population in 2000 to the largest group in 2050. The proportion with lower secondary education or below halves. Also we see that the due to cohort effects the education levels of the 65+ age group falls with a lag.

5. Results – Baseline Simulation

In this section we report the results of our baseline simulations. We have a number of alternative scenarios, defined as follows:

1. Growth. The first scenario assumes that expenditure and taxes per person increase at the rate of growth of productivity. Per capita productivity growth rates are forecasted to average 4 percent until 2010 and 2 percent thereafter.

2. Department of Finance Assumptions. This scenario takes the Department of Finance assumptions given in Box 1 above.

3. The third assumption corresponds to a proposal that increases the lowest valued benefits to 27% of the Average Industrial Wage (Gross), a percentage increase in 2000 of 20% and that other benefits be increased proportionally. Thereafter the growth scenario is followed.

4. Price Linked Social Security Increments. This scenario assumes that social security benefits increase at the rate of prices rather than productivity growth and so fall 4% per annum below the assumption in scenario 1 to 2010 and 2% per annum after this.

We show in table 8, trends in the different components of disposable income over time. We consider trends for each of the projection scenarios. The table reports trends due to compositional shifts in the education attainment of the population, by discounting by the productivity growth rate. We abstract from changes in the population size over time, by reporting per capita income components.

Considering disposable income first, we see that the upwards shift in educational attainment, results in a rise in per capita disposable incomes by 33% between 2000 and 2050. The alternative scenarios report different assumptions about the growth rate in benefit expenditures. The DOF assumption assumes a lower growth rate in pensions than that of productivity growth and so disposable incomes grow at a lower rate. Price indexation of social security benefits results in a lower trend again, while meeting the 27% of GAIW, results in a higher growth path in disposable incomes.

We observe for both social insurance and social assistance benefits that the alternative scenarios push results in the same direction as they did for disposable income. Social

insurance benefits which are largely driven by pension age individuals, rises by 140% over the period under the growth assumption and by about 40% for the DOF assumption. Under the price indexation of benefits, expenditure per capita falls 12%, while for the 27% of GAIW assumption, expenditures rise 180%. Therefore relatively small differences in indexation can cause relatively large differences in expenditure over time.

Social Assistance benefits exhibit a different trend. These benefits are paid primarily to working age individuals. The impact of the rise in educational attainment in this model is to increase the labour supply and wage rates of individuals reducing the need for working age assistance benefits. Therefore we notice that under the growth assumption that social assistance benefits fall by 25% over the period, with proportional adjustments due to the other scenarios.

As the alternative scenarios relate primarily to benefit expenditure levels, we report only the results for the growth scenario for the other income components. Because of the trend in educational composition, market incomes including employment, capital and private pension income rises by 45%. Income taxation being progressive increases at a faster rate by 65%, while regressive social insurance contributions, rise at a lower rate.

We must note that the model merely considers the impact of demographic shifts on current policy. No attempt is made to maintain a balanced budget assumption, which would require other public expenditure sectors to be modelled. Nor is any attempt made to include feedbacks from changes in the structure of the population or alternative expenditure scenarios. We assume that labour supply and demand are in a similar level of equilibrium as in the mid 1990's and that alternative expenditure scenarios do not interact with economic growth rates or employment levels. For this we would need to interact the dynamic microsimulation model with a macro-economic model. Therefore the model simulates the pressures on behaviour without interactions with the rest of the economy or the budget. Nevertheless this first round analysis still has a use as it helps to highlight general directions of trends.

An advantage of a dynamic microsimulation model, is that in addition to aggregate trends, the model can also simulate changes to distributions. In table 9, we consider trends in both income inequality as measured by the Gini coefficient and in poverty rates. We note that the unit of analysis of the model is the family and so as highlighted in table 6, the results are not directly comparable with household based measures. We therefore report results relative to the baseline figure in 2000 as trends are more relevant than levels.

We see that the greater the level of increase in benefits, the greater the impact on inequality. Due to rising education and income levels, income inequality falls most under 27%GAIW assumption and less so under the growth assumption. Under the DOF and price indexation scenarios, inequality rises as the value of benefits falls relative to other incomes.

Turning to poverty, we see that the impact of the compositional shift is to have a rising trend in relative poverty over time. Although average incomes are rising, the incomes of the poorest are rising at a lower rate, therefore more individuals fall into poverty. Although benefits rise at the rate of productivity growth, because of the composition shift in the population, the average disposable income rises at a faster rate and so the poverty line (60% of median equivalised disposable income poverty line) rises at a faster rate than benefits. As a result more of the poorest fall into poverty. The initial increase in benefits in the 27%GAIW scenario means that poverty rates are lowest for this scenario, while the lower the rate of price indexing the greater the poverty rate.

6. Results of Policy Reform – Increased Retirement Age

We now consider the impact of a policy reform, increasing the retirement age by 5 years from 65 to 70. Without a structural model of retirement behaviour, we have to make an assumption about the new retirement path. We firstly assume that in addition to increasing the retirement age, complementary policies are introduced so that participation rates of those in the age group 65-70 increase their participation rates.

We make the assumption that employment rates at 55 are the same and that the participation rate at 70 after the introduction of these policies will be the same as it currently is at 65. We assume that the decline in participation observed between 55 and 65 is "stretched", so that although we will have the same participation rate at 70 after the reform as 65 before, the decline in participation is flatter. We report in figure 7, the impact of this assumption on employment rates for the 55-80 age group for the cohort born in 2000. We see the "stretching" of the work to retirement transition and the cliff edge of employment rates at the retirement age.

In table 10 we consider the impact of the reform on income components. Looking at disposable income first, we see that the lower the level of benefit indexation in the scenario, the greater the impact of the policy. This is because although each scenario has the same in-work income, each has lower benefits to replace and so the denominator is smaller, the lower the level of indexation and so the greater the impact of the reform. For the population as a whole, disposable incomes rise by about 1% per annum, for the growth scenario and by 1.5% to 2.5% for the price indexation scenario. As the reform affects the 55+ age group exclusively, we consider the impact on the incomes of this group separately. The impact on their incomes is about 1.5 to 4 times higher depending on the year of that of the whole population.

While market incomes rise by about 3-4% for the population as a whole, because market incomes are relatively less important for the 55+ age group, we see that impact of the reform is to increase these incomes by about 25% for this age group. Because of the increase in the retirement age and because of the concentration of social insurance benefits amongst the 55+ age group, we see that social insurance benefit expenditures fall substantially by between 25% and 33% in the post 2020 period. In the early years of the reform, the affect is lower as most of the retirees retired at the old retirement age. Social assistance benefits rise, as individuals who are out of work below the retirement age are more likely to receive these benefits. Thus there is a transfer from contribution based to means-tested instruments. However the increase in assistance benefits is more than compensated by the decrease in insurance benefits. As market incomes rise, social insurance contributions and income taxation also rises. The net impact on public finances is relatively small over the transition, but as the

effective retirement age increases by 5 years, the combined effect of all the tax-benefit instruments is simulated to be about a 3-3.5% reduction in net expenditure as a percentage of household disposable income, a figure varying from about 30% to 50% of the expenditure on social insurance pensions. Therefore there are substantial potential public finance impacts of the policy.

In table 11, we report the impact of the policy reform on poverty and inequality. Under the growth assumption, overall poverty rates (60% of median equivalised disposable income poverty line) are assumed to decline by 3-4%. For the 65+ age group poverty rate rise initially as those out of work in the 65-69 age group move from higher valued retirement benefits to lower valued working age benefits. As incomes rise as the full impact of the reform takes effect, the poverty rate for this group falls in 2020 by 7%, however as the poverty line rises, although the incomes of this group, including those of the poor rise, they rise at slower rate than the rise in the poverty line and so the impact on the reform on the headcount poverty line has less of an effect. It however reduces the poverty gap and so the poor are less poor as a result of the reform. Initially, the fall in poverty of the 55-64 age group is counter-balanced by the initial rise in poverty of the 65-69 age group, however in most of the post 2020 period, the decline of the poverty rate of the 55+ age group is greater than for the 65+. Income inequality widens initially as the value of benefits fall, but then falls over time as the incomes of the poorest rise.

7. Conclusions

As in many other western countries, the average length of retirement has been increasing as the effective retirement age has fallen due to early retirement and life-expectancy increases. Over the course of the 1970's the official retirement age at which insurance pensions were paid fell from 70 to 65/66. Continuing current trends, the ratio of elderly people to working age, the dependency rate is likely to double over the first half of the century. This double directed effect is likely to put pressures on the Irish public pension system both through lower revenues from a smaller workforce and greater welfare costs due to longer retirement. The objective of this paper was to

assess the potential impact of an increase in the official and effective retirement ages in Ireland.

We highlight how Ireland has a public pension system with a primarily anti-poverty focus supplanted by a largely funded private pensions system. Unlike many European systems Irish public pensions are flat rate with no public second tier component. As a result, the system is likely to face less of a fiscal crisis than other countries.

Funding of private pensions however is not universal as a number of private schemes and the public pensions system are predominantly PAYG. Recent reforms have required new private pension plans to be funded and a national pension reserve fund has been established to partially fund the occupational pensions of public sector workers and of the public pension system.

With the increase in job flexibility observed during the economic expansion of the 1990's and the transfer of risk from employers to employees, there has been a decline in the period 1985-2002 of 7.5 percentage points of the proportion of employees who are members of occupational pension schemes. The proportion of occupational plans that are defined contributions type plans have increased also. Recent policy reform has aimed to increase the coverage of individual pension plans from a position of about 15% of the labour force in 2002.

Since the mid-1970's the effective retirement age has fallen further due to lower participation amongst older age groups. Although there has been a general decline in the effective retirement age, the official retirement age has an impact as observed by a large decline in the employment rate at this age. However for the self-employed the official retirement age has much less of an impact, with a much more gradual reduction in the participation rate of this group with the official retirement age having only a minor impact. As this group have more control over the retirement age, it might be argued if policies could be introduced to allow for more flexible retirement patterns for employees, then the effective retirement age may be increased.

The main analysis of this paper was to examine the impact of raising the effective retirement age. While raising the official retirement age, the age at which pensions can be received is one strategy, a range of other policies designed to promote work amongst these age groups would be required to raise the effective retirement age. In this paper we suggest some policy remedies, but do not assess explicitly the potential impact of the policies. We merely consider the impact if we could introduce a set of policies whose impact would be to raise the effective retirement age. The precise policy mix, we leave for further analysis.

We adapted a dynamic cohort microsimulation model for Ireland, LIAM to be used for carrying out pension reform analysis on future cross-sections of the Irish population for our purposes. We simulated the impact of raising the official retirement age to 70, and at the same time, individuals having a more gradual withdrawal from the labour market.

In making our projections to 2050, we considered four alternative forecast scenarios, each with alternative benefit indexation assumptions. The principle driving force in our projections is the shift in the educational composition as the proportion of the adult population with upper-secondary or higher level qualifications rises from 42% in 2000 to 74% in 2050. The resulting higher employment and wage rates, is forecasted to increase market incomes by about 44% more than the increase in average productivity. Progressive income taxation results in a higher proportionate increase in income taxation. Increasing employment and wage rates amongst working age is likely to lead to a decline in the working age social assistance benefits. Increasing insurance coverage and elderly dependency rates is however likely to lead to significantly higher social insurance pensions with the rate of increase depending upon the level of indexation.

As a microsimulation model, it is possible to consider the distributional issues. The main influence on the trend in the income inequality under the assumptions we have modelled is the level of benefit indexation. Indexation lower than the rate of productivity growth is likely to increase inequality. Because of the educational shift in the population, the growth in incomes and thus the poverty line (using a relative

poverty line), is likely to grow faster than benefits unless benefits are increased at a faster rate than economic growth. Because most state pensions provide incomes below the poverty line at present, poverty rates are expected to increase as the income of those solely in receipt of pensions falls relative to the population as whole and as the size of the pensioner population rises.

The impact of increasing the retirement age under the assumptions we make varies from 1-2% of household disposable income per capita depending upon the benefit indexation assumption used. The lower the level of indexation, the greater the impact of the policy change, because of the greater gap between in-work income from retiring later and the public pensions one would receive on retiring earlier. One notable impact in driving the increase in disposable incomes is the fall by about 30% of social insurance benefits per annum. In addition, taxes and social insurance contributions rise, combining to result in an improved public finance position, reducing net expenditures by about 3% of disposable income, equivalent to 30-50%, depending on the year of the entire social insurance budget.

Increasing the effective retirement age would also reduce income inequality, but in particular it would help to reduce poverty rates, by about 3% of the total population, but concentrated amongst elderly age groups, it is likely to reduce the poverty headcount rate of this group by about double this, reducing the poverty gap by more. Therefore increasing the effective retirement age is likely to simultaneously reduce public finance pressures and reduce poverty rates.

One needs to be cautious about the numerical estimates produced by such a modelling framework. Firstly the results are based upon a prototype model under development and so results are likely to alter as the model specifications improve. Secondly the model does not contain any feedbacks with the rest of the economy, and so therefore policies that may reduce or increase public deficits have no influence on growth or employment rates. Lastly the model does not attempt to balance the public budget and therefore in reality large imbalances may not be allowed to continue indefinitely. The method, although not containing these interactions, provides a valuable method for highlighting broad impacts of policy, demographic and economic changes. One can

view the results as being potential pressures, signalling the general directions of the impacts rather than a forecast as to what will happen. Dynamic microsimulation modelling as a science needs to improve to incorporate these interactions, linking micro results to macro-economic models and CGE models. In addition behaviour, especially in this case, that of the retirement decision, could be modelled in a more structural fashion, allowing us to produce a better prediction of the likely responses of policy change on the actual date of retirement.

Overall, economic ageing is less of an issue in Ireland than in many other EU countries. According to EC (2002), Ireland although having a higher elderly dependency ratio than at present, will have amongst the lowest elderly dependency ratio in the EU, at about 85% of the average rate across the EU. This combined with a relatively cost effective public pensions policy is likely to result in less serious public finance pressures. In addition the policy levers exist to alleviate any build up in these pressures. Pre-funding of the pension fund will reduce these pressures, while the absence of an official indexation policy allows the government, as it has done in the past, to have lower pension increases during more difficult financial periods. Therefore the argument on public finance grounds for the introduction of a policy to increase the effective retirement age is less strong than in other EU countries.

Ireland however has above average poverty rates in the EU. In addition, the elderly in 2000 have a higher poverty risk[16] of 43.3% compared with 16.9% of the working age population (DSFA, 2002). This is because the elderly have not been able to benefit to the same extent from the economic boom as working age people. When one utilises the official measure of poverty, used by the National Anti-Poverty Strategy, as defined by a combination of deprivation indicators and financial poverty, the gap is lower. The level of measured poverty is also much lower. However even if the extent of people living on very poor incomes is not captured by the official measure it is fair to say that 43.3% of the elderly population living on incomes of less than 60% of median income raises concerns.

[16] Using a 60% of median equivalised disposable income poverty line.

As the elderly population rises and if indexation of pensions does not keep pace with earnings growth, then the position is likely to get worse. Therefore it may be necessary to increase pension amounts by a greater amount than the indexation levels considered here to alleviate poverty. If that is the case, the public finance pressures will be greater. Raising the effective retirement age however is a potential mechanism for reducing poverty, both by reducing poverty levels through more people working and by raising extra resources due to a larger labour force to pay for further poverty alleviation policies. It will also shift the intergenerational burden of providing resources to maintain the elderly from younger generations to the older generations themselves.

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TABLES AND FIGURES

Table 1. Number of Recipients of Old Age/Retirement Benefits 1992-2001 (000's)

	Social Insurance					Social Assistance			
Year	Old Age Contrib.	Retirement	Survivor's Contrib.	Invalidity	Disability Pension	Old Age Non-Contrib.	Pre-Retirement	Survivor's Non. Contrib.	Total
1992	72.7	55.2	85.5	4.5	1.1	113.6	15.4	18.6	366.6
1993	71.9	58.4	86.4	4.8	1	111	15.9	18.8	368.2
1994	70.8	62.2	90.7	4.9	1	108.3	15.3	19.0	372.2
1995	69.2	65.8	94.7	5.2	1	103	15	19.1	373.0
1996	68	69.7	96.1	5.3	1	101.6	14.2	19.0	374.9
1997	70	71.8	97.3	5.3	1	98.8	13.6	18.8	376.6
1998	71.7	75.3	98.5	5.5	1	95.9	13.9	18.4	380.2
1999	76.2	78.9	99.8	5.7	1	93	13.1	18.0	385.7
2000	86.2	78.4	100.4	6	1.1	90.7	12.5	17.4	392.7
2001	94.9	80.3	101.3	6.2	1.2	89.1	11.8	16.8	401.6

Source: Statistical Information on Social Welfare Services (2001)

Table 2. Private and Occupational Pension Coverage 2002 (as % of Age-Group)

Age Group	20	25	35	45	55	65+	Total 20-65
Males							
Self-Employed and Assisting Relatives with Employment Pension	0.6	6.9	15.2	18.9	19.8	19.7	12.3
Employees with an Employer's Pension Only	21.7	36.2	40.2	38.6	29.7	7.4	35.1
Employees with a Personal Pension Only	1.3	5.5	6.6	4.8	5.0	2.2	5.0
Employees with both Employer's and Personal Pension	0.7	2.8	4.3	5.1	3.2	1.1	3.4
Employees with no Pension	71.7	37.9	19.6	16.5	18.6	16.8	30.8
Self-Employed and Assisting Relatives with no Pension	3.8	10.7	14.0	16.0	23.7	52.8	13.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Self-Employed Coverage Rate	14.0	39.2	52.0	54.2	45.6	27.1	48.0
Employees Coverage Rate	24.9	54.0	72.3	74.6	67.0	39.0	58.6
Total Coverage Rate	24.4	51.3	66.4	67.5	57.7	30.4	55.8
Employee Occupational Coverage Rate	23.5	47.3	62.9	67.2	58.3	31.2	51.8
Personal Pension Coverage Rate (Employees)	2.2	10.0	15.4	15.3	14.4	11.9	11.4
Personal Pension Coverage Rate	2.7	15.2	26.1	28.9	28.0	23.0	20.8
Females							
Self-Employed and Assisting Relatives with Employment Pension	0.0	1.5	3.3	4.3	4.3	6.3	2.4
Employees with an Employer's Pension Only	22.5	40.1	42.8	35.6	27.4	11.5	36.2
Employees with a Personal Pension Only	0.8	3.6	3.9	4.9	4.9	6.0	3.6
Employees with both Employer's and Personal Pension	1.0	2.3	2.4	2.8	1.9	0.0	2.2
Employees with no Pension	74.7	48.2	41.7	45.0	48.2	50.8	50.2
Self-Employed and Assisting Relatives with no Pension	1.0	4.3	5.9	7.4	13.3	25.3	5.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Self-Employed Coverage Rate	0.0	26.0	35.6	36.7	24.2	19.9	31.0
Employees Coverage Rate	24.6	48.8	54.1	49.1	41.5	25.6	45.5
Total Coverage Rate	24.3	47.5	52.4	47.6	38.4	23.8	44.3
Employee Occupational Pension Coverage Rate	23.8	45.0	49.8	43.5	35.5	16.8	41.6
Personal Pension Coverage Rate (Employees)	1.8	6.2	7.0	8.8	8.2	8.8	6.2
Personal Pension Coverage Rate	1.8	7.4	9.6	12.1	11.0	12.3	8.2
Male and Female							
Employee Occupational Pension Coverage Rate	23.6	46.2	56.6	56.1	49.2	25.3	46.9
Total Coverage Rate	24.4	49.6	60.5	59.7	51.7	29.0	51.0

Source: Quarterly National Household Survey 2002.
Note 1. Self-Employed include Assisting Relatives

Table 3a. In-work, Employment, Full-time and Self-Employment Rates for Males Aged 54-74 (as % of Age Group)

Age	In-work	Employee	Full-time	Self-employed
54	85.3	45.6	38.2	39.7
55	85.6	48.9	40.7	36.8
56	84.0	44.2	33.1	39.8
57	81.1	38.9	27.2	42.2
58	76.4	36.9	24.3	39.5
59	72.9	37.8	23.9	35.2
60	68.7	32.6	19.7	36.1
61	64.9	26.2	16.7	38.7
62	67.4	23.6	14.6	43.8
63	59.7	23.9	17.1	35.8
64	60.8	20.2	7.3	40.6
65	57.5	18.6	3.6	38.9
66	47.6	7.7	1.8	39.9
67	39.1	6.2	1.5	32.9
68	34.6	4.1	1.6	30.5
69	33.7	5.5	0.6	28.2
70	34.2	6.2	1.3	28.0
71	31.3	3.4	0.0	27.9
72	31.1	4.6	0.0	26.4
73	31.1	5.0	1.3	26.1
74	24.7	2.9	0.5	21.8

Source: Based on Pooled ECHP Data 1994 – 2000.

Note:

1. In-work: if an individual has income from work
2. Employee: An individual who has income from employment and where employee income is at least as important as any self-employment income.
3. Full-time: Employee and works at least 30 hours per week.
4. Self-Employed: An individual who has income from self-employment and where self-employed income is more important than any employee income.

Table 3b. In-work, Employment, Full-time and Self-Employment Rates for Females Aged 54-74 (as % of Age Group)

Age	In-work	Employee	Full-time	Self-employed
54	28.3	22.0	8.8	6.4
55	29.5	23.6	9.4	5.9
56	25.2	19.5	4.5	5.7
57	23.6	17.7	6.0	6.0
58	24.3	17.0	5.4	7.3
59	23.0	16.9	5.7	6.2
60	21.6	15.3	4.9	6.3
61	19.3	13.2	5.1	6.2
62	17.3	12.6	3.5	4.7
63	14.0	9.1	4.3	4.9
64	12.7	7.3	1.9	5.5
65	12.0	6.6	1.1	5.4
66	6.4	4.1	0.0	2.3
67	5.9	3.2	0.0	2.7
68	4.2	0.8	0.0	3.4
69	6.5	2.3	0.0	4.1
70	6.2	2.5	0.0	3.8
71	4.7	0.9	0.0	3.8
72	5.1	1.1	0.0	4.0
73	5.8	0.9	0.0	4.9
74	5.4	1.1	0.0	4.3

Source: Based on Pooled ECHP Data 1994 – 2000.

Note:

1. In-work: if an individual has income from work
2. Employee: An individual who has income from employment and where employee income is at least as important as any self-employment income.
3. Full-time: Employee and works at least 30 hours per week.
4. Self-Employed: An individual who has income from self-employment and where self-employed income is more important than any employee income.

Table 4. Employment Rate by Education Level by Age Group

Age Group	20-29	30-39	40-49	50-59	60-65
Simulated Data					
Males					
Lower Secondary	0.57	0.62	0.67	0.58	0.49
Upper Secondary	0.71	0.79	0.79	0.76	0.56
Third Level	0.89	0.97	0.98	0.96	0.92
Total	0.76	0.85	0.86	0.83	0.70
Females					
Lower Secondary	0.26	0.25	0.55	0.41	0.19
Upper Secondary	0.61	0.53	0.51	0.49	0.47
Third Level	0.82	0.83	0.78	0.72	0.57
Total	0.68	0.66	0.65	0.60	0.50
Cross-Section Data					
Males					
Lower Secondary	0.60	0.79	0.78	0.77	0.49
Upper Secondary	0.72	0.88	0.89	0.85	0.40
Third Level	0.75	0.93	0.96	0.94	0.87
Total	0.65	0.81	0.78	0.75	0.53
Females					
Lower Secondary	0.40	0.27	0.33	0.24	0.18
Upper Secondary	0.67	0.55	0.51	0.46	0.13
Third Level	0.73	0.78	0.74	0.66	0.39
Total	0.59	0.44	0.38	0.28	0.14

Source: LIAM and *Living in Ireland Survey*.

Table 5. Distribution of Years Not Worked by Education Level

	0	1-9	10-14	15-19	20+	0
Simulated						1994 Data
			Males			
Lower Secondary	44.4	7.4	18.5	22.2	7.4	49.9
Upper Secondary	52.0	7.6	5.7	14.3	20.4	52.0
Third Level	74.5	0.5	7.0	11.0	7.0	74.1
Females						
Lower Secondary	11.1	0	3.7	44.4	40.7	10.3
Upper Secondary	35.3	1.8	2.7	11.6	48.7	34.4
Third Level	52.7	0.4	1.6	6.6	38.8	55.4

Source: LIAM and Living in Ireland Survey 1994.

Table 6. Inequality for various income measures (Gini coefficient)

Income Definition	Market income	Disposable Income	Redistribution
Simulated – Lifetime	0.45	0.35	0.10
Simulated – Lifetime Annualised	0.48	0.40	0.08
Simulated – Annual	0.54	0.41	0.13
Simulated – Annual (94 weights)	0.65	0.44	0.21
1994 Data – Annual (household)	0.54	0.34	0.20
1994 Data – Annual (family)	0.62	0.42	0.20

Source: LIAM.

Notes

1. For comparability reasons we simulate the 1998 tax-benefit system on the 1994 data.
2. Redistribution is measured by the difference between the Gini for Market income and the Gini for Disposable income, known as the Reynolds Smolensky Index (with reranking).
3. All incomes and components equally shared between adults. 1 (Head), 0.7 (Adult Dependants), 0.5 (Child Dependants) is the Equivalence Scale used.

Table 7. Education Levels of Cross-Sections 2000-2050

Year	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Aged 20+											
Lower Sec.	57.8	52.5	48.3	44.6	41.2	38.1	35.2	32.6	30.3	28.1	26.4
Upper Sec.	26.6	29.2	31.2	32.9	34.4	35.8	37.0	38.0	38.9	39.6	40.0
University	15.6	18.3	20.5	22.5	24.4	26.1	27.8	29.4	30.8	32.4	33.7
Aged 65+											
Lower Sec.	82.5	80.1	76.4	72.5	68.8	64.5	59.1	53.8	47.9	41.2	35.2
Upper Sec.	10.5	11.8	13.7	15.9	18.0	21.0	25.0	29.1	33.9	37.0	38.4
University	7.0	8.1	9.9	11.6	13.2	14.5	15.9	17.1	18.3	21.8	26.4

Source: LIAM

.

Table 8 Growth of Income Components per Capita Due to Compositional Changes 2000-2050 (Discount Rate Equals Growth Rate)

Year	2000	2010	2020	2030	2040	2050
Disposable Income						
Growth	100	111	118	125	130	133
DOF	100	109	115	120	125	126
Price Indexation	100	104	112	116	119	120
27% GAIW	104	114	121	128	134	137
Social Insurance Benefits						
Growth	100	104	127	163	203	236
DOF	100	94	104	121	136	143
Price Indexation	100	71	85	90	92	88
27% GAIW	120	125	152	196	244	282
Social Assistance Benefits						
Growth	100	91	86	82	77	74
DOF	100	82	70	61	52	45
Price Indexation	100	61	58	45	35	28
27% GAIW	120	109	103	98	93	89
Growth Scenario						
Market Incomes	100	116	126	135	140	144
Income Taxation	100	120	135	147	156	164
Social Insurance Contributions	100	117	125	130	132	131

Source: LIAM

Table 9. Trends in Income Inequality and Poverty Head Count 2000-2050

	2000	2010	2020	2030	2040	2050
Gini						
Growth	100.0	99.2	98.7	98.5	98.1	97.5
DOF	100.0	102.3	104.6	106.7	108.9	110.2
Price Indexation	100.0	109.9	109.3	113.2	116.8	119.1
27% GAIW	94.1	93.9	93.5	93.3	93.0	92.7
Poverty Rate						
Growth	100.0	102.8	105.3	106.5	106.9	108.6
DOF	99.9	105.6	108.7	109.7	111.3	112.6
Price Indexation	100.0	110.9	113.2	112.1	113.2	114.6
27% GAIW	93.2	95.0	96.9	95.4	98.2	98.2

Source: LIAM

Notes

1. Both measures are based upon equivalised disposable income (EDI), where the equivalence scale used is Head 1, Other adults 0.7, Children 0.5.
2. Poverty Headcount utilises a poverty line of 60% of median EDI.

Table 10 Impact of Raising Retirement Age on Income Components (% change Income)

	2000	2010	2020	2030	2040	2050
Population						
Disposable Income						
Growth	0.0	0.4	0.8	0.7	1.0	0.6
DOF	0.0	0.4	1.2	1.1	2.1	1.7
Price Indexation	0.0	0.0	1.7	1.5	2.6	2.2
27% GAIW	0.0	0.4	0.4	0.3	0.6	0.3
Other income Components[1]						
Market Income	0.0	0.7	3.2	2.9	3.8	3.4
Social Insurance Benefits	0.0	-2.6	-29.3	-30.8	-28.1	-26.5
Social Assistance Benefits	0.0	1.2	0.8	2.7	2.8	3.4
Income Taxation	0.0	0.9	2.3	2.1	2.6	1.0
Social Insurance Contributions	0.0	4.1	5.8	6.0	7.7	8.4
Tax-Benefit System	0.0	-0.4	-3.1	-3.0	-3.6	-3.6
Aged 55+[1]						
Disposable Income	0.0	1.1	3.3	1.1	2.5	1.5
Market Income	0.0	21.9	26.2	25.8	27.0	28.9
Social Insurance Benefits	0.0	-3.2	-31.4	-32.8	-29.4	-27.4
Social Assistance Benefits	0.0	5.1	1.4	9.3	8.0	10.7
Income Taxation	0.0	3.7	8.1	6.4	6.6	3.8
Social Insurance Contributions	0.0	21.9	26.2	25.8	27.0	28.9

Source: LIAM
Notes:
1. Growth scenario is used for these measures.

Table 11. Impact of Raising Retirement Age on Income Inequality and Poverty Head Count 2000-2050

	2000	2010	2020	2030	2040	2050
Population	0.0	-1.7	-3.3	-4.1	-3.4	-2.4
Aged 65+	0.0	4.0	-7.3	-6.5	-4.1	-2.6
Aged 55+	0.0	0.0	-10.5	-7.9	-3.1	-0.6
Gini	0.0	0.5	-0.1	0.0	-0.5	-0.8

Source: LIAM

Notes

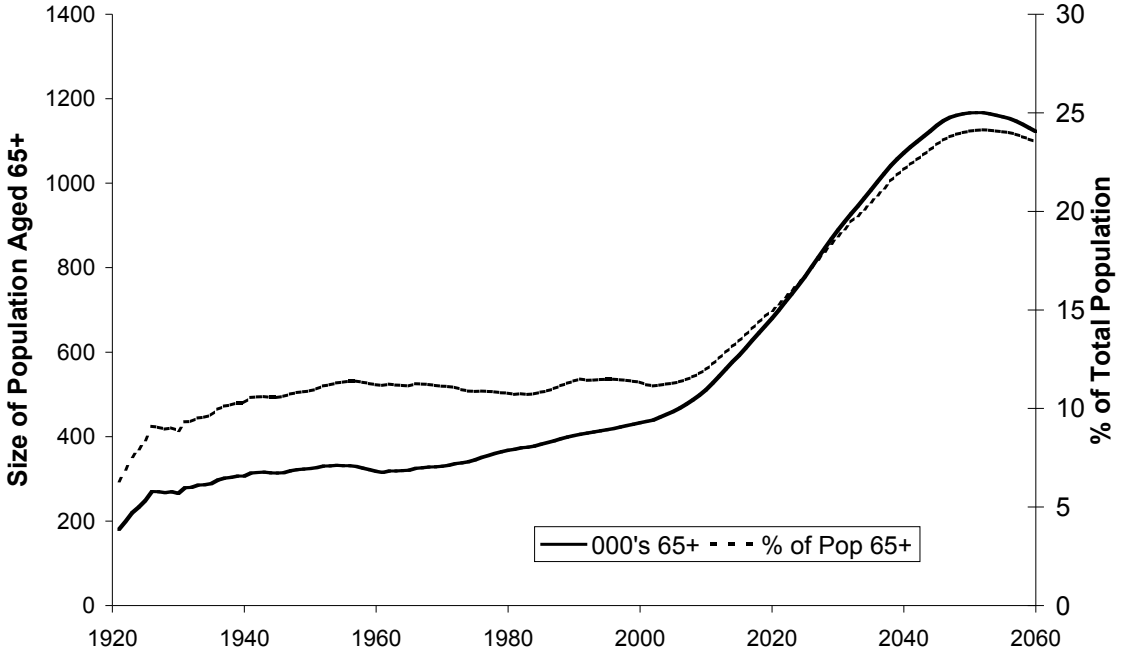
1. Both measures are based upon equivalised disposable income (EDI), where the equivalence scale used is Head 1, Other adults 0.7, Children 0.5.
2. Poverty Headcount utilises a poverty line of 60% of median EDI.

Figure 1: Age Distribution of Irish Population, 1961, 2002 and 2050

Source: Census 1961,2002 and Author's Calculations.
Note: Projection Assumptions.

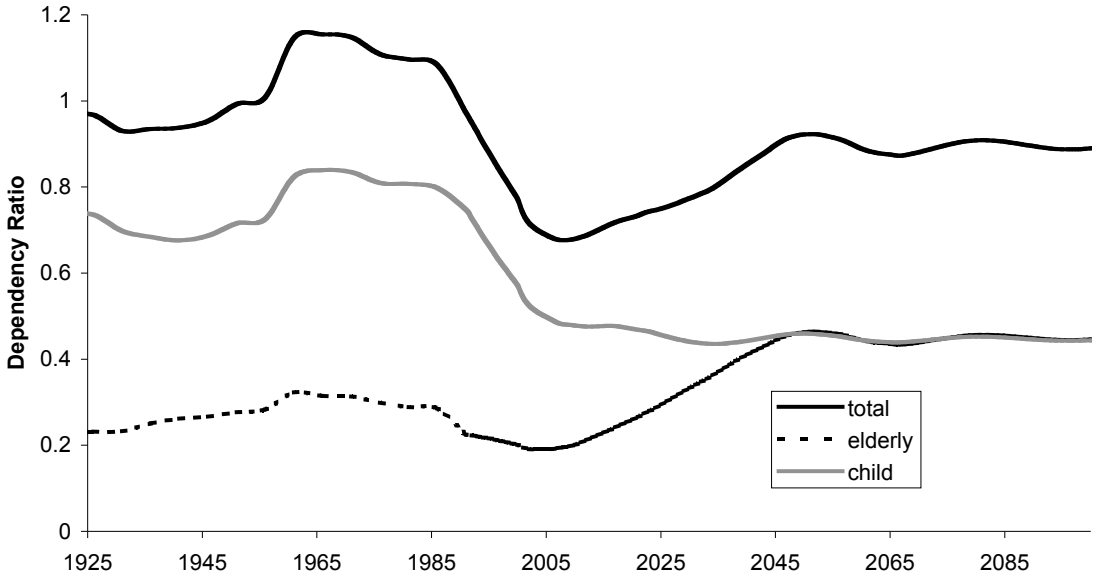
1. Birth Rate remains constant at 1.75,
2. Life Expectancy for males rises to 77.8 and for females to 84 in 2031.
3. Net immigration of 15000 is assumed 2001-2005, 10000 per annum 2006-2010 and 5000 per annum 2011-2031

Figure 2: Number of People Aged 65+, 1922- 2060.



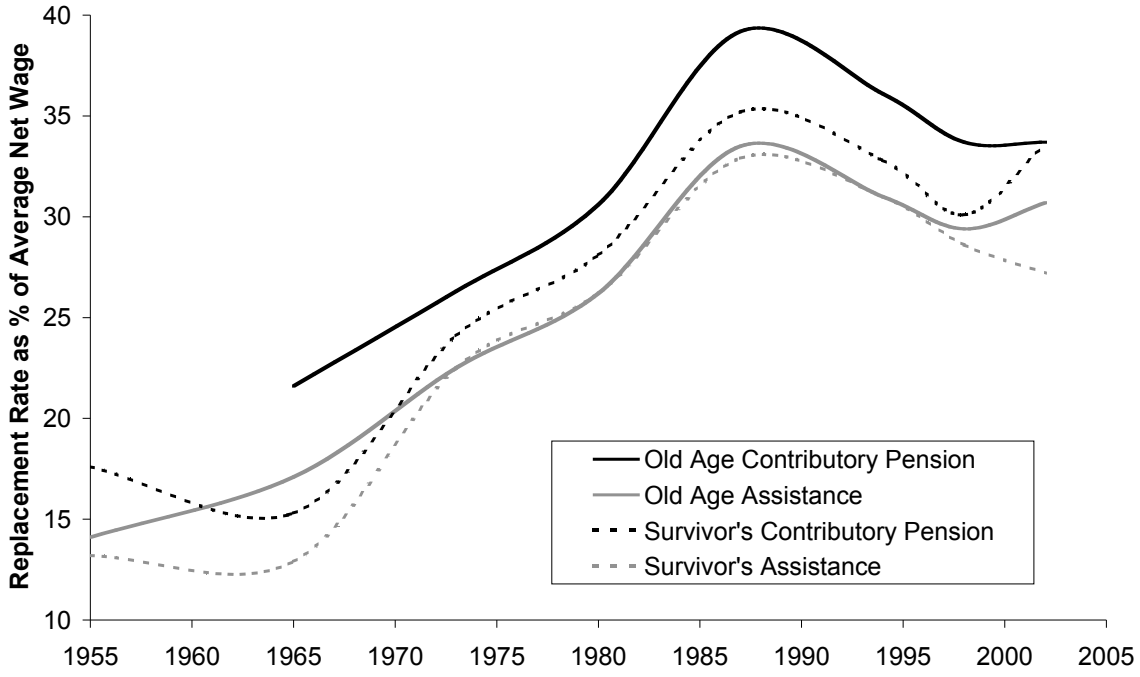
Source: Census Various Years and Author's Calculations.
Note: Projection Assumptions as per Figure 1.

Figure 3: Child, Elderly and Total Dependency Ratios, 1925- 2100.



Source: Census (Various Years) and Author's Calculations.
Note: Projection Assumptions as per Figure 1.

Figure 4: Net Replacement Rate for Old Age, Early Retirement and Survivor's Benefits, 1955-2002.

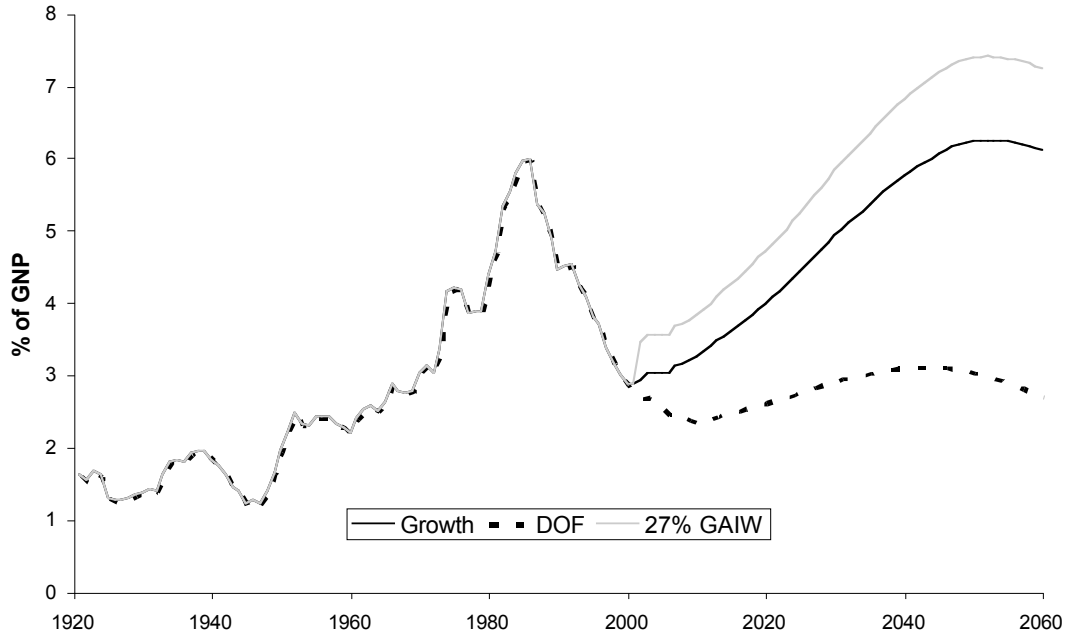


Source: O'Donoghue (2004).

Notes:

1. Net Replacement Rate is defined as Net Out of Work Income divided by Net In-work Income at the Average Wage.
2. Net Out of Work Income: Benefits – Out of Work Taxes – Out of Work Social Insurance Contributions
3. Net In-work Income: Average Earnings + In-Work Benefits – In Work Taxes – In Work Social Insurance Contributions

Figure 5: Historical and Projected Old Age and Survivor's Benefit Expenditure, 1955-2060.



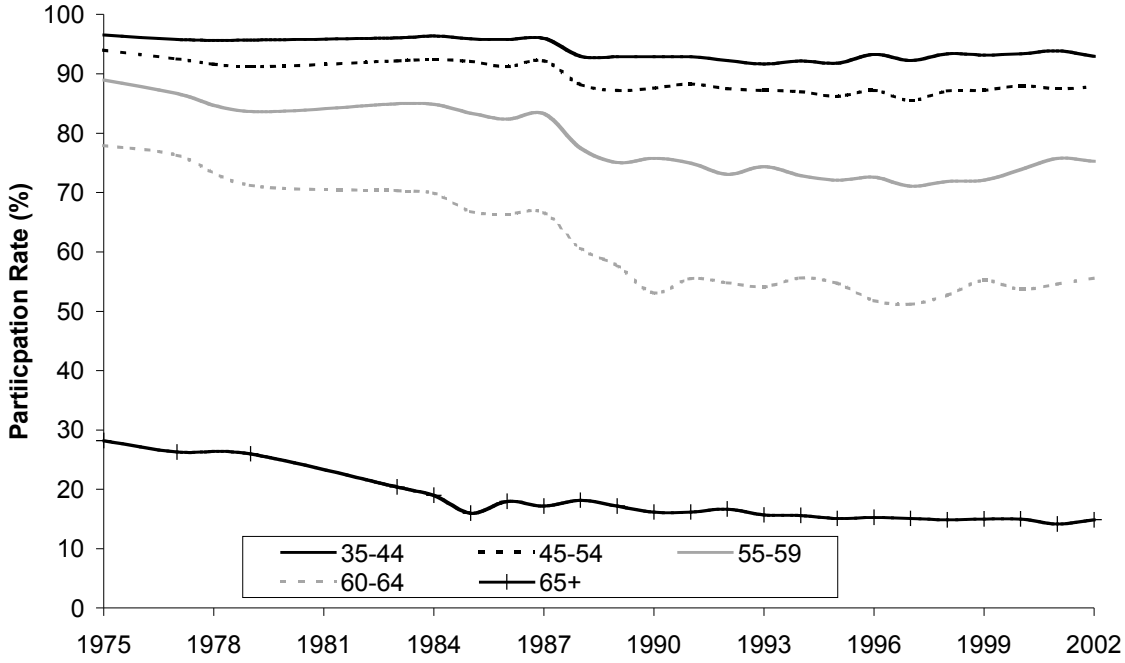
Source: O'Donoghue (2004).

Notes:

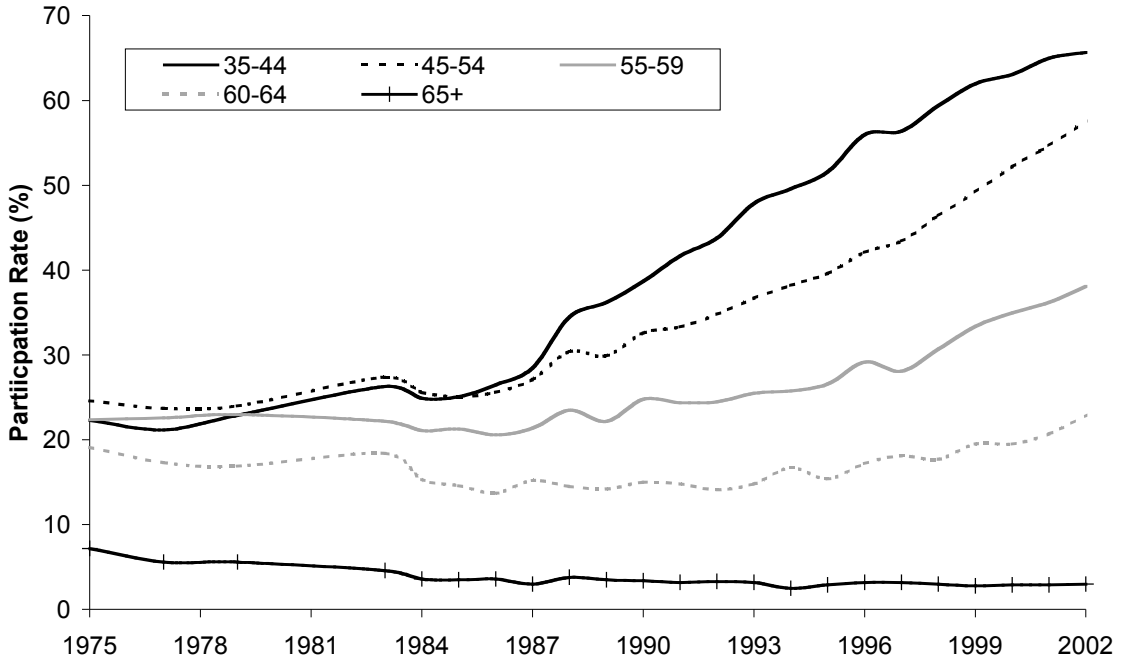
1. Growth Assumption is based on the assumption that benefit rates grows at the rate of productivity growth.
2. Department of Finance (DOF) projections, see Box 1.

Figure 6: Labour Force Participation by Age 1975-2002

Males

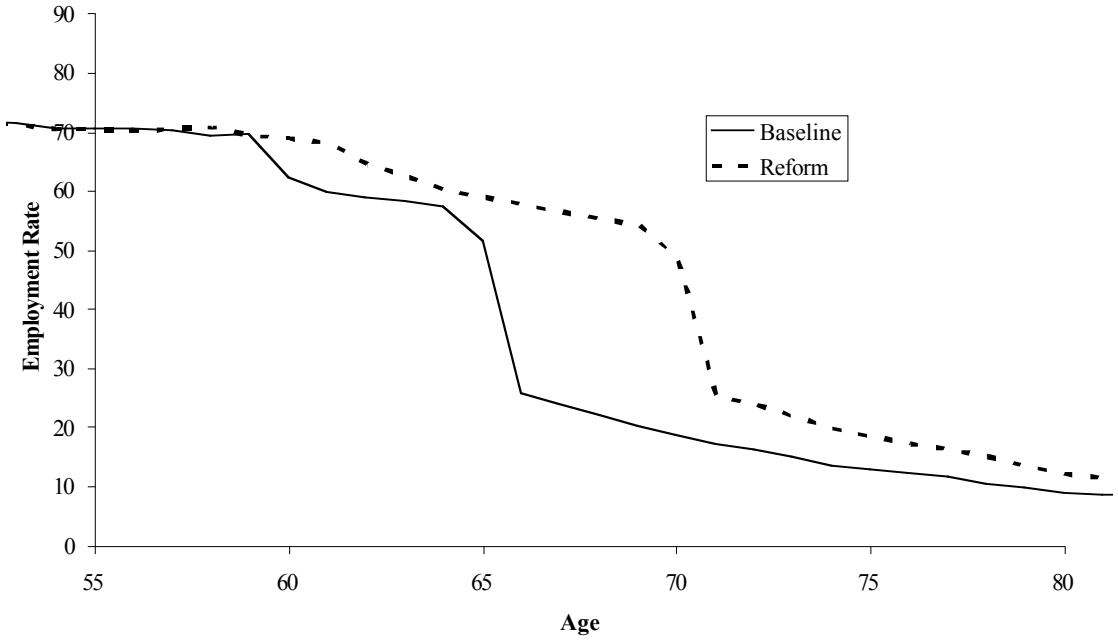


Females



Source: Labour Force Survey 1975- 1997, Quarterly National Household Survey 1998-2002.

Figure 7: Simulated Employment Rate by Age (55-80) for Baseline and Reform Simulation for Cohort born in 2000



Source: LIAM.