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Abstract

Wide differences between effective or realised average tax rates and tax yields that would result if statutory tax rates were strictly applied indicate tax compliance and collection problems. Due to the greater politicisation of tax systems in transition economies (TEs), we would expect the shortfalls in effective tax yields for TEs to be larger than a benchmark for the mature market economies where tax systems are well established, the administrative capacity is stronger and tax arrears are tolerated less frequently. The methodology involves calculating an effective/statutory (E/S) tax ratio. Initial results indicate that the leading TEs have E/S ratios similar to the EU average. We find a positive correlation between progress in transition and effective tax administration, as measured by our E/S ratio. For slow reformers, the effectiveness of tax collection appears to vary with the extent of state control. Those TEs that have maintained the apparatus of the state have done well in tax collection compared to those countries where there is evidence of state decay. This raises a number of broad policy issues relating to the speed of transition, the interaction of politics and economic reforms, the capacity of the state to govern and the need for market institutions to develop.

Keywords: statutory taxation, average tax rate, tax collection, effective administration, transition economies

JEL Classification: H2, H32, H87, P5.

1. Introduction

This paper attempts to measure the effectiveness of tax administration in transition economies (TEs) and how it compares to a benchmark for the mature market economies. We measure the effectiveness of tax administration by comparing statutory tax rates with effective tax yields. This method of measuring the administrative capacity of tax systems has been alluded to in the taxation literature but not systematically pursued in cross-country comparisons. Alex Radian, in his inquiry into tax administration in poor countries, noted that effective tax rates are lower than legal tax rates (Radian, 1980). David Newbery raised the issue of differences between statutory and effective tax rates, again in the context of developing countries, when he stressed the importance of examining the effective tax system rather than the legally defined tax system (Newbery and Stern, 1987). In the same World Bank publication, Vito Tanzi suggested that the gap between the statutory tax system and the effective tax system might be large in developing countries (Newbery and Stern, 1987). Elsewhere, Burgess and Stern (1993) argued that the wedge between the statutory and effective tax systems can be reduced by improvements in administrative capabilities. In this paper, we take a methodology previously used for measuring fiscal or revenue capacity in federal states (ACIR, 1962) and adapt it to enable inter-country comparisons of effective vs. statutory taxation. We then use actual fiscal and national accounts data from 25 TEs and, as a benchmark, the average for the 15 member countries of the European Union, to measure the effectiveness of tax administration.

Tax exemptions, deferrals, write-offs and arrears that firms receive or extract from the state are widespread, not only in transition economies but in market economies as well. In a broader sense, these tax concessions are often manifestations of a tax system that is politicised. One possible result of this bargaining and general politicisation of the tax system

is a low level of tax compliance combined with a high incidence of tax avoidance.[1] Measuring the extent of this financial aid using firm-level information is difficult and faces obvious data difficulties, e.g., these concessions may not be widely known or may not show up in the government's budget. By measuring the difference between effective and statutory taxation at the aggregate level, our methodology enables us to obtain aggregate measures of the degree of effectiveness of tax collection that can be compared across countries, for different taxes, and over time. In this paper we develop indicators that allow us to measure how broadly and strictly valued-added tax, payroll tax and corporate income tax are implemented and complied with in TEs. We use the average of the EU-15 countries as an appropriate benchmark for comparison. Our focus is on comparisons for the most recent year available; comparisons over time will be pursued in future work.

2. The Tax System in TEs

The tax system that existed under the socialist command economy was different from a Western-style tax system. There was no corporate income tax system, in the usual sense of the term. State enterprises were subservient to the various ministries and any 'profits' made were expropriated by the state. Likewise, losses were made good by arbitrary pricing and subsidies. Often, tax rates were numerous and non-parametric, tax structures were complex and differentiated, and tax liabilities were discretionary and negotiable. The main sources of tax revenue were typically enterprise profit tax, turnover tax (with highly differentiated, product-specific rates) and payroll taxes; direct taxes on individuals were unimportant. Although taxation as a percentage of GDP was high in socialist countries, administrative costs

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[1] This paper deals with tax avoidance as distinct from tax evasion. Tax avoidance is defined as the use of the tax system to minimise tax liabilities or obligations. It is a legal activity as distinct from the illegal (and acutely difficult to measure) activity of tax evasion. One way that enterprises can reduce their tax burden is by transferring their tax liabilities abroad. Transfer pricing is common in market economies where multinational corporations use their foreign subsidiaries that operate in low tax jurisdictions to reduce their overall tax burden. A well-known case is that of Rupert Murdoch's News Corporation, a company that made £1.4 billion in profits in Britain but reportedly paid no corporation tax there (*The Economist*, 29/1/00).

were low and tax collection was straightforward as firms tended to be large and closely monitored. In the Soviet system, 'taxes' were collected from the enterprise, with the State Bank acting as the fiscal agent of the state. Once the socialist system collapsed, TEs, some lacking an explicit tax system (or culture), had to build a market-oriented, rule-based tax system (including a market-type tax administration) from scratch. The creation of a new tax system involved the introduction of a corporate income tax system. Not only did this involve changes in how enterprises were treated by the state, in terms of taxation, but it was also introduced in conjunction with other policies, such as price liberalisation, demonopolisation and privatisation. A VAT system to replace the turnover tax was introduced in the early years of transition and was in place in most TEs by 1994. Tax on individuals accounted for a small proportion of the total tax take in socialist countries: the transition to a market economy meant that a personal income tax system, as operates in market economies, was also to be introduced.

In the context of TEs and taxation, we are interested in the hardening of budget constraints of firms. Hence, the firm is the unit of analysis in this paper. As for the different taxes paid by the firm, corporate income or profit tax, value-added tax and social security taxes are mostly linear, flat rate, taxes.[2] Neither sales taxes (because they are levied at one stage only) nor excise taxes (because they are product-specific) are considered in our study. We do, however, treat social security contributions as a payroll tax.

As mentioned above, we will concentrate on three taxes paid by the firm: corporate income tax (CIT), value-added tax (VAT) and social security tax (SST). Although VAT is essentially a tax charged on final purchasers, it is imposed at different stages of production at the firm level. For these three taxes, we estimate the difference between effective average tax rates and tax yields that would result if statutory tax rates were strictly applied. The methodology is explained below.

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[2] A linear tax is a tax whose marginal rate is constant.

3. Methodology

Our methodology is based on one commonly used in measuring tax or fiscal capacity in federal states. The ACIR Representative Tax System (RTS) method was initially proposed in the early 1960s and has been modified on several occasions since then (see ACIR 1962, 1971, 1982). Essentially, by applying national average or representative tax rates to member-state tax bases, the RTS method shows the amount of revenue that could be collected by the individual member states of a federal country, i.e. their fiscal capacity. With some modifications, we apply this methodology to sovereign states (and transition countries, in particular) rather than to states within a federal system.

We begin with some definitions. Statutory tax rates are the rates that taxpayers are required to pay by law. Effective tax rates are the realised average tax rates. These are the same average tax rates as employed by Whalley (1975), Lucas (1990) and Mendoza et al. (1994).[3]

Let Y be the gross tax base and T be actual tax payments; hence, income net of tax is Y-T. We denote by t the statutory tax rate applied to gross income. The effective tax rate e, also defined on a gross basis, is calculated by dividing actual tax payments T by the appropriate gross tax base, or

$$e \equiv \frac{T}{Y} \tag{1}$$

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[3] These are aggregate average tax rates as distinct from the effective marginal tax rates that are commonly used in studies of household income, income distribution and taxation. Aggregate tax rates are normally used in macroeconomic modeling and in the taxation, economic growth and supply-side economics debate. For the problems associated with measuring effective tax rates, see Fullerton (1984).

Using the statutory and effective tax rates thus defined, we calculate two indicators that measure the effectiveness of tax administration. The first indicator is the ratio of effective tax to statutory tax. The effective/statutory (E/S) ratio is defined as follows:

$$Effective/statutory\ ratio \quad \equiv \quad \frac{e}{t} \quad \equiv \quad \frac{T}{tY} \tag{2}$$

This indicator measures the extent of the wedge between the statutory tax rate and the realised average tax rate. A ratio close to one indicates that the effective tax rate is close to the statutory tax rate. A ratio below one indicates that the effective tax yield is falling short of what application of the statutory tax rate would yield. Differences across countries in the extent of this shortfall in revenue may be accounted for by tax breaks, tax arrears and tax avoidance measures.[4]

As approximations of the gross tax base Y, we use national accounts measures of income: for VAT, total national income (GDP); for SST, income from labour; and for CIT, income from capital. These are, of course, only rough approximations of the actual statutory tax bases. For example: even in market economies, large portions of the economy are exempt from VAT (e.g., public administration and education); corporate income tax applies only to corporations and the usual tax base is net of depreciation and interest; for all three taxes, entities must usually be over a certain size threshold before becoming liable for taxation. Furthermore, the national accounts statistics of transition countries are generally regarded as less reliable than those of developed market economies, including their statistics on the division of GDP into labour and capital income. National accounts measures of income do, however, have the important advantages of being both readily available and, in principle, readily comparable across countries. Moreover, our focus is not on levels of effective taxation in countries but

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[4] Accounting for tax evasion will depend on whether the national accounts adjust for the hidden economy. If there is an evasion adjustment in the calculation of GDP, tax evasion is captured by our measure; how fully will depend on the accuracy of the adjustment.

on comparisons of levels across countries, and, as noted, the reasons for these deviations between income measures and statutory tax bases are found in all countries.

Our second indicator entirely avoids these possible problems with national accounts measures of income by simply not attempting to match tax payments to the appropriate tax base. The normalised tax yield (NTY) instead relates tax payments, adjusted for cross-country differences in statutory rates, to GDP, and is defined as follows:

$$Normalised\ tax\ yield \quad \equiv \quad \frac{T}{GDP}\frac{b}{t} \tag{3}$$

where t is the statutory tax rate and b is a benchmark rate. Put simply, the normalised tax yield tells us what the tax yield (for a particular tax) would be for a specific country if the statutory tax rate were the same for all countries.

In the definitions above, we have used the convention of a tax base that is gross of tax. In practice, statutory tax rates are sometimes defined relative to a tax base that is inclusive of tax and tax liabilities are paid out of gross income; and sometimes statutory rates are defined relative to a tax base that is net of tax. Corporate income tax (like personal income tax) is an example of the former; tax liability is calculated by applying the corporate tax rate to gross profit. VAT and SST are examples of the latter. Firms calculate their gross VAT liability by "adding on" VAT as a percentage of the pre-tax price, and SST is typically calculated as a percentage of wages and salaries paid. We use the former convention – the tax base is gross of tax – for our calculations for all three taxes considered. This requires adjustments to the statutory tax rate for both VAT and SST.[5]

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[5] We are therefore using gross income only and adjusting statutory rates as necessary. The alternative approach would be to use statutory rates in conjunction with gross or net income, as appropriate. This approach, however, encounters data availability problems with net income. As noted above, we use national accounts measures of gross income that are only approximations of the actual tax base. Calculating net income from these approximations and the actual tax yield introduces further measurement error into the tax base approximations. By contrast, our tax rate adjustment in equation (5) is an identity and introduces no such measurement error.

Denote by t^N the tax rate applied to net income $Y(1-t)$ that would yield the identical tax revenue as the tax rate t applied to gross income Y. We then have, by definition,

$$tY \equiv t^N \left[Y(1-t) \right] \qquad (4)$$

Rearranging equation (4) yields

$$t \equiv \frac{t^N}{1+t^N} \qquad (5)$$

Equation (5) is used to convert a tax rate defined by statute as applying to net income into the equivalent tax rate on gross income.

We illustrate this adjustment by reporting the benchmark rates used to calculate our normalised tax yield indicator. We denote by b^N the benchmark net of tax rate equivalent to the gross rate b. We take as our benchmark rates the approximate (rounded to the nearest five or ten per cent) average statutory tax rates in use in the 15 member states of the European Union: b^N=20% for VAT, b^N=40% for SST, and b=35% for CIT. The following table reports the equivalent gross and net rates for these benchmarks; the figures in bold are the statutory rates as legally defined by statute.

Table 1: Benchmark Tax Rates, Gross and Net Equivalents
Rates defined by statute in bold

	b	b^N
VAT	16.7%	**20%**
SST	28.6%	**40%**
CIT	**35%**	53.8%

4. Data Coverage and Sources

Our primary interest is in examining the administrative capacity of tax systems in TEs and how it compares to levels in well-established market economies. We use the mean of the EU-15 countries as a benchmark, taking 1996 as the benchmark year.

There are 25 ex-socialist countries in our study; the TEs that are not included are those where tax data are difficult to obtain (Mongolia, Vietnam), where the tax system is highly complicated (China) or where war has occurred (Serbia-Montenegro, Bosnia-Herzegovina). Ten of our 25 countries are CEE countries (Albania, Bulgaria, Croatia, Czech Republic, FYR Macedonia, Hungary, Poland, Romania, Slovak Republic and Slovenia) for which we use data primarily for the period 1991 – 1997. The remaining 15 are all FSU countries (Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan) for which the relevant period is 1992 – 1997.[6] All these countries have a corporate income tax system, of sorts. All 25 countries with the exception of Croatia, FYR Macedonia and Slovenia had a VAT system in place by 1996. All TEs in our study have a social security tax system mostly financed by payroll taxes, with contributions being made by employers and/or employees. For all countries in our study, tax coverage is for general government, comprising of central and state, regional or provincial units of government and local government.

An exercise in calculating statutory versus effective taxation depends on data pertaining to tax rates, tax takes and tax bases. As for statutory taxation, the basic tax rates are taken primarily from international tax handbooks. In particular, we used the IBFD's *European Tax Handbook,* Coopers & Lybrand's *International Tax Summaries* and Ernst & Young's *Worldwide Tax Guides*. We also used various EBRD *Transition Reports*. Tax payments were obtained from the governments' fiscal accounts where taxes are reported on a cash basis,

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[6] The USSR was disbanded in December 1991 and was replaced by fifteen independent republics.

i.e., counting actual receipts rather than accrued liabilities. Where possible, tax payments data are from the IMF's *Government Finance Statistics Yearbook* (*GFSY*) or the CIS *Statistical Yearbook*. Other publications used include the OECD's *Revenue Statistics*, the IMF's Staff Country Reports and statistical yearbooks for various countries.

As already mentioned, the tax bases for the three types of taxes are taken from the national accounts. For VAT, we use GDP as a proxy for the VAT base. Although in all VAT systems there are some goods and services that are exempt from VAT, the most important of these exemptions are quite standard (e.g., public administration, education) and hence GDP is a reasonable proxy. For CIT, we use gross operating surplus as a proxy for the tax base on corporate capital income. Operating surplus corresponds to value-added after deducting the compensation of employees and net taxes on production; it is the balancing item in the national accounts. Due to the difficulties in acquiring reliable estimates for the operating surplus of corporations for 25 countries, we instead use the operating surplus of the economy.[7] For SST, we use compensation of employees as a proxy for the tax base. Compensation of employees is the sum of gross wages and salaries plus employers' social contributions.

Although imperfect, these are reasonably good approximations given the omissions in the national accounts, the dubious nature of some transition countries' data and the cross-country nature of the exercise. The main publications used for national accounts data are the IMF's *International Financial Statistics Yearbook,* the OECD's *National Accounts Main Aggregates*, the CIS *Statistical Yearbook* and statistical yearbooks for various countries.

The data sources used for all 25 countries are listed in Table 5, in the Appendix.

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[7]Likewise, we use gross rather than net operating surplus because the treatment of depreciation varies from one jurisdiction to another. Aside from depreciation provisions, corporate tax systems differ from country to country, in respect of treatment of interest payments, stock appreciation provisions and integration with the personal income tax system. Accordingly, computations arising from cross-country comparisons of corporate tax systems should be treated with caution. This is particularly true when the cross-country comparisons include the likes of Russia whose accounting rules are different to international standards.

The statutory tax rates and the actual tax/GDP ratios for each of the three taxes, for our 25 countries are reported in Table 2.

As we can see from Table 2, many of the 25 transition countries in our study have the same statutory tax rates. This is particularly true for value-added tax, where 11 of the FSU countries have a VAT rate of 20 per cent. Yet, the actual tax/GDP ratios across countries differ quite substantially. Assuming tax bases are not too dissimilar across countries, one interpretation of differences in tax ratios is the quality of tax administration across countries. The methodology outlined in section three allows us to investigate this further.

5. Results and Analysis

Table 3 is a cross-country comparison showing the two indicators for the three different taxes for the 25 transition countries. We report estimates for the TEs for 1997 as the 1998 data for some FSU countries is distorted by the August 1998 Russian crisis. The benchmark is the 1996 average of the EU-15 countries. Our estimates are highly approximate and precise values should be treated accordingly. Nevertheless, they do provide a measure of effective tax administration and, in the case of some TEs, point to poor tax collection and weak tax administration. [8]

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[8] Treisman (1999) uses a 'tax accounting' method to measure the effectiveness of tax collection, in Russia. In his paper, the unexplained parts of the fall in tax revenues are attributed to the poor quality of tax administration, i.e. ineffective tax collection.

Table 2: Statutory Tax Rates and Tax/GDP Ratios for 25 TEs, 1997

Country	VAT		SST		CIT	
	Statutory tax rate	VAT/GDP	Statutory tax rate	SST/GDP	Statutory tax rate	CIT/GDP
CEE Countries						
Albania	12.5	4.6	42.5	3.9	30	0.7
Bulgaria	22	6.2	44	6.9	36	6.4
Croatia	--	--	43.4	14.4	35	2.0
Czech Republic	22	7.1	47.5	15.2	39	3.4
FYR Macedonia	--	--	30.1	12.3	15	0.7
Hungary	25	7.9	57	13.1	18	1.9
Poland	22	8.3	48.2	11.0	38	3.1
Romania	18	4.7	34	7.1	38	4.3
Slovak Republic	23	8.4	50	14.4	40	3.7
Slovenia	--	--	38	13.8	25	1.2
FSU Countries						
Armenia[1]	20	3.3	38	2.9	30	2.5
Azerbaijan	20	3.8	39	2.5	32	2.8
Belarus	20	9.4	37	10.1	30	4.7
Estonia	18	10.4	33	10.7	26	1.9
Georgia	20	3.2	34	2.2	20	0.6
Kazakhstan	20	3.5	32	6.2	30	2.4
Kyrgyzstan	20	5.6	37	5.9	30	1.1
Latvia	18	8.8	37	10.5	25	2.4
Lithuania	18	8.7	31	7.0	29	1.6
Moldova	20	9.4	40	7.2	32	2.4
Russia	20	7.2	39.5	9.9	35	4.2
Tajikistan	20	1.5	38	1.6	40	1.2
Turkmenistan	20	7.2	31	4.5	25	5.2
Ukraine	20	8.1	40	11.1	30	6.1
Uzbekistan[1]	17	6.1	43	6.7	37	7.9

Sources: IBFD, 1998; IMF 1999.
Notes: (1) The figures for Armenia and Uzbekistan are for 1996.
          -- = not applicable.

As we can see from the table, the (unweighted) means of the E/S ratios in the EU-15 for VAT, SST and CIT are 0.45, 0.88 and 0.24 respectively. When we normalise the EU-15 VAT, SST and CIT yields at our benchmark rates of 20% (b=16.7%), 40% (b=28.6%) and 35% respectively, we get normalised tax yields of 7.4, 12.5 and 3.0 percent of GDP respectively. How do the rates for TEs compare with these levels for the EU?

Table 3: Statutory and Effective Taxation, 1997

E/S = effective/statutory ratio; NTY = normalised tax yield

Country	VAT		SST		CIT		EBRD Transition Indicator
	E/S	NTY	E/S	NTY	E/S	NTY	
CEE Countries							
Albania	0.42	7.0	n.a.	3.7	n.a.	0.8	2.58
Bulgaria	0.34	5.7	0.61	6.5	0.31	6.3	2.75
Croatia	--	--	n.a.	13.6	n.a.	2.0	3.00
Czech Republic	0.40	6.6	0.94	13.5	0.23	3.0	3.46
FYR Macedonia	--	--	n.a.	15.2	n.a.	1.6	2.63
Hungary	0.40	6.6	0.80	10.3	0.26	3.7	3.67
Poland	0.46	7.7	0.76	9.7	0.20	2.9	3.42
Romania	0.31	5.1	0.83	8.0	0.21	4.0	2.67
Slovak Republic	0.45	7.5	0.93	12.3	0.22	3.3	3.25
Slovenia	--	--	0.94	14.3	0.15	1.6	3.21
FSU Countries							
Armenia[1]	0.20	3.3	0.27	3.0	0.16	3.0	2.38
Azerbaijan	0.23	3.8	0.46	2.6	0.12	3.1	2.04
Belarus	0.57	9.4	0.87	10.7	0.39	5.4	1.63
Estonia	0.68	11.4	0.83	12.3	0.22	2.6	3.42
Georgia	0.19	3.2	0.38	2.5	0.04	1.1	2.71
Kazakhstan	0.21	3.5	0.68	7.3	0.15	2.8	2.71
Kyrgyzstan	0.34	5.6	0.68	6.2	0.06	1.3	2.83
Latvia	0.58	9.6	0.76	11.1	0.23	3.4	3.08
Lithuania	0.57	9.6	0.71	8.4	0.13	2.0	3.04
Moldova	0.56	9.4	0.60	7.2	0.18	2.6	2.63
Russia	0.43	7.3	0.71	10.0	0.33	4.2	3.00
Tajikistan	0.09	1.5	0.31	1.6	0.04	1.0	1.58
Turkmenistan	0.43	7.2	n.a.	5.5	n.a.	7.3	1.46
Ukraine	0.49	8.2	0.80	11.1	0.63	7.1	2.46
Uzbekistan[1]	0.42	7.0	0.61	6.4	0.47	7.5	2.38
EU-15 Mean	0.45	7.4	0.88	12.5	0.24	3.0	

Notes: (1) The estimates for Armenia and Uzbekistan are for 1996.
        -- = not applicable. n.a. = not available.
        EBRD Transition Indicator: average indicator for 1997

The results indicate that the 25 transition countries, on average, are not as effective in tax collection or enforcement compared to the average for EU countries. The (unweighted) means of the E/S ratio for the TEs for VAT, SST and CIT are 0.40, 0.69 and 0.23 respectively. Moreover, the variations from the mean are large for the TEs, compared to the EU countries. For the EU-15 countries, the standard deviations of the E/S ratio for the three tax categories are 0.06, 0.18 and 0.12 respectively. This compares to 0.15, 0.20 and 0.14 respectively for the TEs.

For many transition countries, revenue erosion has become a serious obstacle in their attempts to embrace effective fiscal policy.[9] Pre-transition, many ex-socialist economies had high government revenue shares of GDP. With most of economic activity taking place in the state sector, tax collection was a straightforward task. In contrast, for a market economy the private sector dominates and confrontation between taxpayers and tax collectors is not uncommon. Thus, in the transition from a centrally planned to a market economy, a fall in revenue was not unexpected. Yet, for some transition economies, the fall in revenue has been excessive, with tax/GDP ratios currently at levels below what is considered normal in many market economies. Of course, for many TEs, with income per capita levels below $1,000 per annum, tax capacity is low (see Tait, Gratz, and Eichengreen, 1979). Our research indicates that, in addition to having a low tax capacity, TEs have relatively low tax effectiveness rates.

We now turn our attention to factors related to effective tax administration in transition countries. We begin by investigating the relationship between the effectiveness of tax collection and progress in transition. A priori, we might expect to find a positive relationship between progress in transition and effective tax administration.

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[9] The primary objective of taxation is to raise revenues, as efficiently and equitably as possible, in order to finance government spending. It was the great French financier Jean-Baptiste Colbert (1619-83) who once said, "The art of taxation consists in so plucking the goose as to obtain the largest possible amount of feathers with the smallest possible amount of hissing." In many of the FSU countries, the government's revenue problem is further exasperated by the realisation that a portion of revenue is in non-cash form.

We take as our measure of progress in transition the average of the EBRD transition indicators for 1997;[10] these are reported in Table 3 for all 25 TEs in our study. We present the relationship between progress in transition and the effectiveness of tax administration by means of a scatterplot in which the average EBRD transition indicator is plotted on the X-axis and the E/S ratio is plotted on the Y-axis. This exercise is carried out separately for the three categories of taxes covered in our study.[11] The horizontal line in each of the scatterplots is the relevant EU mean, plotted to provide a benchmark for comparison. All three scatterplots are depicted in Figure 1. Our second indicator, the normalised tax yield (NTY), is plotted against the average EBRD transition indicator in Figure 2. As the E/S ratio and the NTY measure are highly correlated, the scatterplots in Figures 1 and 2 are similar.

The relationship between progress in transition and effectiveness of tax administration comes out quite clearly in two of the three taxes we are examining, namely VAT and SST. The largest difference is between the so-called leading reformers (Poland, Hungary, Slovenia, Czech and Slovak Republics, the Baltic States) and the laggard reformers (the Balkans and most of the CIS countries), but there are other differences of interest between the TEs. One interesting comparison is between the Ukraine and Russia. Although Russia has made more progress in transition (as judged by the EBRD transition indicators) than the Ukraine, it fares worse in terms of tax collection (as measured by our E/S ratio). Russia's poor relative performance as regards tax collection may have something to do with the nature of its federal tax system.[12] In particular, perverse incentives arising from divided property rights between different levels of government exasperate the tax collection problems in Russia. It is not uncommon for enterprises and regional governments to collude against the federal government and the tax collection agency, the State Tax Service (STS). Likewise, any improvements in

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[10] The EBRD transition indicators are a set of numerical indicators across a range of dimensions, under the headings – markets and trade, enterprises, and financial institutions. The purpose is to measure the progress of economic reforms. A more detailed explanation can be found in any of the EBRD *Transition Reports*.

[11] As we can see from Table 3, the results for CIT are different to those for either VAT or SST. This observation applies to the two groups of countries in our study, namely EU countries and transition countries. Accordingly, in any analysis of our calculations, we treat the three categories of taxes separately.

[12] Recently described as a 'country that has moderate statutory tax rates but a corrupt system of tax administration.' (see Friedman et al., 1999).

tax collection at subnational levels are likely to be penalised or "taxed away" by reductions in transfers (see Shleifer and Treisman, 2000).[13]

We examine the three categories of taxes separately. In the discussion that follows, we only refer to one set of scatterplots, namely Figure 1.

- Value-Added Tax

There is a strong positive correlation between progress in transition and the effectiveness of VAT collection. All the leading reformers that have a VAT system have E/S ratios that are close to the EU benchmark of 0.45. These advanced reformers are all clustered in the top right-hand corner of Figure 1a. In contrast, the majority of the laggard reformers are clustered in the bottom left-hand quadrant: the slow reformers have E/S ratios below the EU benchmark. The interesting feature is captured in the top left-hand quadrant where a small number of slow reformers (Moldova, Belarus, Turkmenistan and Ukraine) have high E/S ratios. Slow reformers with relatively high E/S ratios and normalised VAT yields may be accounted for by the observation that these TEs have maintained a functioning state, a feature that may have prevented the revenue erosion that is prevalent in most of the slow reforming TEs. [14]

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[13] According to various sources, tax collection (and, in particular, federal tax) improved in Russia in 1999.

[14] The ability of some slow reforming TEs to collect tax (Ukraine and Belarus, in particular) has been alluded to in the transition literature, in Murrell (1996), EBRD (1994, 1999) and elsewhere. Johnson, Kaufmann and Shleifer (1997) argue that it is the repressive nature of states (Belarus, possibly Uzbekistan and Turkmenistan) and their willingness to suppress the unofficial economy that explains high collection rates. The case of Moldova is less clear. For example, it is true that VAT collection in Moldova has improved, due to the recent elimination of many exemptions. Nonetheless, its total tax/GDP ratio, at close to 30% in 1997, seems very high for a country with a GDP per capita of less than $600. One possible explanation is that the GDP figure may be an underestimate, failing to adequately account for the unofficial economy.

- Social Security Tax

As in the case of VAT, there appears to be a positive correlation between progress in transition and the effectiveness of SST collection. All the leading reformers occupy the top right-hand quadrant of Figure 1b. This group of TEs have E/S ratios similar to the EU benchmark of 0.88. This is in sharp contrast to the bulk of the slow reformers that have E/S ratios and normalised tax yields below the EU benchmark. Among this group, the lowest E/S ratios are concentrated in TEs that have suffered internal conflicts (Armenia, Azerbaijan and Tajikistan) or that have witnessed a collapse of the state (Georgia, for example). Again, we see that there are a small number of so-called slow reformers that have managed to maintain tax discipline, in this case with respect to payroll taxes. Belarus and the Ukraine both have E/S ratios close to the EU benchmark. As with VAT collection, strong presidential leadership (Lukashenka and Kuchma, respectively) combined with functioning state institutions, albeit in need of reform, may explain these high E/S ratios and normalised tax yields.

- Corporate Income Tax

The mean of the E/S ratio in the EU-15 for corporate income tax is 0.24. The normalised tax yield is 3% of GDP. Again, we see from Figure 1c that the leading TEs are all tightly clustered around the EU benchmark. This contrasts sharply with the laggard reformers, some with E/S ratios above the EU level. One possible explanation for why some of the slow reformers have high normalised CIT yields is the upward inflation bias in profits arising from historical cost accounting. High inflation rates prevalent in TEs would generate large profits and high tax yields. This may explain why the leading TEs, in general, experience a fall in the E/S ratio for CIT during the transition period. The average E/S ratio in 1991, at the beginning of transition, for Hungary, Poland and Czechoslovakia was 0.42. By 1997 the average E/S ratio for these (now four) advanced reformers had fallen to 0.23.

To summarise, leading reformers (advanced CEE countries and the Baltic States) and countries that have maintained a functioning state (Belarus, Ukraine and Uzbekistan) have higher levels of tax compliance and collection than either slow reformers (Romania, Bulgaria),[15] countries with decaying or corrupt states (Russia, Georgia) or countries that have suffered internal conflicts (Armenia, Azerbaijan, Tajikistan). A somewhat similar result emerged from the EBRD/WB Business Environment and Enterprise Performance Survey (BEEPS) section on progress in economic reform, quality of governance and state intervention (see text below). Whereas countries that have adopted partial reforms score badly in terms of the quality of governance, it is the most advanced and the least advanced countries that score well in terms of governance. Likewise, the survey results indicate that "…progress in transition is not necessarily synonymous with a reduction in state intervention in enterprises" (EBRD, 1999, p.122). Again, high levels of state intervention are evident in many of the leading transition countries and in the least advanced transition countries. These results raise serious issues, including the need to rethink, in the context of the transition experience and, often, in a political and institutional vacuum, the state's capacity to govern and the need for market institutions to develop.

The EBRD's transition indicators summarise overall "progress in transition". We now briefly explore one possible specific contributor to the ineffectiveness of tax administration, namely, corruption and bribery. It is not uncommon for enterprises in TEs (and in market economies, although presumably less so) to pay bribes to government officials in return for various services or favours. As these payments are direct private benefits to public officials, they do not turn up in the government fiscal accounts. Yet, in all other respects, they can be viewed as unofficial taxes that add to the tax burden of enterprises. Is it possible that TEs that report low 'official' tax revenue shares as a percentage of GDP have high 'unofficial' taxes, in the form of bribes?

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[15] After the 1996/97 financial crisis in Bulgaria, the authorities introduced various reform measures, including changes to the tax administration system. These and other tax reform measures contributed to an improvement in tax collection in 1998, reflected in higher E/S ratios for both VAT and SST.

In Table 4 we reproduce a measure of the extent to which firms pay bribes to government officials. The measure was constructed from the BEEPS, conducted by the EBRD and the World Bank in over 3,000 firms in 20 countries and reported in EBRD (1999). To estimate a measure of bribes, firms were asked what percentage of annual revenues were made by 'firms like yours' in 'unofficial payments' to public officials. In the countries surveyed, the average bribe tax ranges from a low of 2.1% of annual revenues in Croatia to a high of 8.1% in Georgia. For comparison, Transparency International's Corruption Perceptions Index (CPI), the most recognised measure of corruption, is also reported.[16]

Table 4: Bribe tax and Corruption for TEs

Country	Ave. Bribe Tax	CPI	Country	Ave. Bribe Tax	CPI
CEE Countries			*FSU Countries*		
Albania	na	7.7	Armenia	6.8	7.5
Bulgaria	3.5	6.7	Azerbaijan	6.6	8.3
Croatia	2.1	7.3	Belarus	3.1	6.6
Czech Republic	4.5	5.4	Estonia	2.8	4.3
FYR Macedonia	na	6.7	Georgia	8.1	7.7
Hungary	3.5	4.8	Kazakhstan	4.7	7.7
Poland	2.5	5.8	Kyrgyzstan	5.5	7.8
Romania	4.0	6.7	Latvia	na	6.6
Slovak Republic	3.7	6.3	Lithuania	4.2	6.2
Slovenia	3.4	4.0	Moldova	6.1	7.4
			Russia	4.1	7.6
			Tajikistan	na	na
			Turkmenistan	na	na
			Ukraine	6.5	7.4
			Uzbekistan	5.7	8.2

Sources: EBRD *Transition Report 1999*; Transparency International's website http://www.transparency.de/

Figures 3a and 3b plot our E/S ratio measure for VAT and SST against the average bribe tax as a percentage of annual firm revenues, for 18 and 19 transition countries respectively.[17]

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[16] The organisation Transparency International ranks countries, on the basis of surveys, in terms of the degree to which corruption is perceived to exist among public officials and politicians. The CPI score ranges from 0 (highly corrupt) to 10 (virtually corrupt free). To allow for comparisons with the BEEPS bribery tax, we have adjusted the CPI scores, e.g. Bulgaria's CPI score of 3.3 is adjusted to 6.7. The CPI scores recorded in Table 4 are for 1999; scores for previous years are unavailable for many of the TEs.
[17] From the 20 countries in the EBRD/WB survey, we exclude Croatia and Slovenia from Figure 3a as neither country had a VAT system in place in 1997. Figure 3b does not include Croatia as there is no E/S ratio available.

Countries that have a high measure of effective tax administration (Estonia, Poland and Belarus, for example) also have a relatively low average tax bribe. In contrast, countries with ineffective tax administration (Armenia, Azerbaijan and Georgia, for example) have a relatively high average tax bribe. The correlation coefficients are −0.54 and −0.74 respectively. As we did before, we plot the normalised tax yield (NTY) in Figure 4. Again, as we expect, the scatterplots in Figures 3 and 4 are similar.

If we use Transparency International's CPI as the measure of corruption, we get similar results. Although interesting, more evidence needs to be gathered before any strong conclusions can be drawn.

6.   Conclusions and Further Research

In this paper we adopted an existing methodology to measure the effectiveness of tax administration. Comparing effective with statutory taxation allows us to get a handle on the administrative capacity of tax systems. The results indicate that, on average, the 25 TEs are not as effective in tax collection as compared to the average of the EU countries. A more surprising result is the differences between TEs: in particular, the ability of some slow reformers to maintain high tax collection rates.

As for policy implications, tax administration reforms have lagged behind general tax reforms since transition began, often because administrative reforms (and consequently the benefits) take time. Market-oriented fiscal institutions (tax administration, treasury) do not develop overnight. Administrative reforms involve changes in incentives and in the behaviour of taxpayers and public officials. In general, TEs with tax collection problems need to widen the tax base by subjecting previously exempt income to taxation, reduce exemptions and allowances and, where possible, implement lower (to discourage tax avoidance and evasion) and single (to avoid the rent-seeking activities of producers) tax rates. Ending the tradition of

bargaining and negotiating between the authorities and the taxpayer might prove more difficult given the political constraints in TEs. For federal systems (Russia, for example), intergovernmental fiscal relations need to be rule-based and transparent. Specific tax administration measures for TEs might include strengthening the tax administration (assessment, collection, enforcement) agencies in terms of organisation and personnel (as well as the legal and accounting professions), codification of the various tax laws, greater efforts at improving the data on taxpayers, simplifying the registering, reporting and filing requirements, greater penalties (monetary and otherwise) for non-compliance and/or positive encouragement for compliance and educating taxpayers about their obligations. In the implementation of these reforms, it is important that the constraints (and the traditional values and practices) of TEs are recognised.[18]

As for future work, we would like to extend our data coverage to a larger set of countries. In particular, we would like to include non-EU OECD countries and, where possible, developing countries. Inclusion of non-EU OECD countries would provide us with an alternate and possibly more suitable benchmark to the EU-15. The more interesting possibility would be to apply our methodology to tax data for a range of developing countries in Latin America, Asia and Africa and for the Newly Industrialised Countries of South East Asia. This would allow us to compare ex-socialist transition countries with countries that closely resemble TEs either in terms of initial conditions or in terms of a 'transition' experience. For example, a more suitable comparison for the fast growing countries like Poland, Estonia and Hungary might be the Tiger countries of South East Asia. Likewise, the FSU countries of Central Asia and the Caucasus states more resemble, in terms of GDP per capita and sectoral composition, developing countries than EU countries. One implication of this would be a need to extend the tax classifications to include foreign trade taxes. Although revenue from duties on international trade is tiny for EU countries, it is a major source of revenue for developing

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[18] Many of the TEs are poor with very low incomes per capita. In 1997, the Caucasus states of Armenia, Azerbaijan and Georgia had an (unweighted) average GDP per capita of US$640 approximately. The five Central Asian states (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan) had an average GDP per capita of approximately US$615 (EBRD, *Transition Report 1999*).

countries and for some transition countries. By extending the coverage to developing countries, it would also allow us to make more meaningful policy prescriptions as regards tax reform for transition countries. This is the next step in our research. Alternately and in the context of EU enlargement, tax harmonisation and fiscal convergence, our effective tax rates can be used to examine the overall tax burden and the distribution of the tax burden across different tax bases in EU countries and in the transition accession countries. We will pursue this work at a later stage.

In this paper, we briefly examined some factors that might impinge on tax administration and collection in transition countries. In particular, we explored the significance of two factors, namely progress in transition and corruption. We would like to extend this line of research. Other possible explanatory factors may include the shadow economy and tax evasion, the initial conditions, political constraints and the distribution of power, GDP per capita and levels of development. Some of these factors are not unique to TEs, applying to developing and developed countries alike.

With respect to fiscal and tax reform, the first decade of transition has focused primarily on tax design. If further revenue erosion is to be avoided, the next decade must concentrate on administrative reform. In the *Transition Report 1994*, the EBRD called for a strengthening of tax administration, an issue that "…lies at the core of fiscal reform" (EBRD, 1994, p.88). For many TEs, this policy recommendation is as relevant today as it was in the early years of transition.

References

Advisory Commission on Intergovernmental Relations (ACIR). 1962. *Measures of State and Local Fiscal Capacity and Tax Effort*, M-16, Washington D.C..

Burgess, R. and N. Stern. 1993. Taxation and Development. *Journal of Economic Literature,* 31: 762 – 830.

Ebrill, L. and O. Havrylyshyn. 1999. Tax Reform in the Baltics, Russia, and other Countries of the Former Soviet Union. *IMF Occasional Paper* No. 182, Washington D.C.: International Monetary Fund.

European Bank for Reconstruction and Development. 1999. *Transition Report 1999: Ten Years of Transition*. London: EBRD.

European Bank for Reconstruction and Development. 1994. *Transition Report 1994.* London: EBRD.

Friedman, E., S. Johnson, D. Kaufmann and P. Zoido-Lobaton. 1999. Dodging the Grabbing Hand: The Determinants of Unofficial Activity in 69 Countries. Paper presented at the Fifth Nobel Symposium in Economics: The Economics of Transition, Stockholm, September 10 – 12.

Fullerton, D. 1984. Which Effective Tax Rates? *National Tax Journal*, 37: 23 – 41.

Holzman, F.D. 1962. *Soviet Taxation: The Fiscal and Monetary Problems of a Planned Economy*. Cambridge: Harvard University Press.

International Bureau of Fiscal Documentation. 1998. *European Tax Handbook*. Amsterdam: IBFD.

International Monetary Fund. 1999. *Government Finance Statistics Yearbook 1999*. Washington, D.C.: IMF.

International Monetary Fund. 1999. *International Financial Statistics Yearbook 1999*. Washington, D.C.: IMF.

Interstate Statistical Committee of the Commonwealth of Independent States. 1999. *Commonwealth of Independent States in 1998: Statistical Yearbook*. Moscow: Statistical Committee of the CIS.

Johnson, S., D. Kaufmann and A. Shleifer. 1997. The Unofficial Economy in Transition. *Brookings Papers on Economic Activity*, 159 – 221.

Lopez-Claros, A. and Sergei V. Alexashenko. 1998. Fiscal Policy Issues during the Transition in Russia. *IMF Occasional Paper* No. 155, Washington D.C.: International Monetary Fund.

Lucas, R.E., Jr. 1990. Supply-Side Economics: An Analytical Review. *Oxford Economic Papers,* 42: 293 – 316.

Mendoza, E.G., A. Razin, and L.L. Tesar. 1994. Effective Tax Rates in Macroeconomics: Cross-Country Estimates of Tax Rates on Factor Incomes and Consumption. *Journal of Monetary Economics*, 34: 297 – 323.

Murrell, P. 1996. How Far Has the Transition Progressed? *Journal of Economic Perspectives*, 10: 25 – 44.

Newbery, D. 1995. *Tax and Benefit Reform in Central and Eastern Europe*. London: Centre for Economic Policy Research.

Newbery, D. 1987. Taxation and Development. In David Newbery and Nicholas Stern, eds., *The Theory of Taxation for Developing Countries*. Washington, D.C.: Oxford University Press for the World Bank.

Organisation for Economic Co-operation and Development. 1999. *OECD National Accounts Main Aggregates 1960 – 1997*. Paris: OECD.

Organisation for Economic Co-operation and Development. 1999. *OECD Revenue Statistics 1965 - 1998*. Paris: OECD.

Radian, A. 1980. *Resource Mobilization in Poor Countries: Implementing Tax Policies*. New Brunswick, NJ: Transaction Books.

Reeves, H. Clyde. 1986. *Measuring Fiscal Capacity*. Oelgeschlager, Gunn & Hain in association with the Lincoln Institute of Land Policy.

Schaffer, M.E., and L. Ambrus-Lakatos, eds., 1997. *Fiscal Policy in Transition, Forum Report of the Economic Policy Initiative, no.3*. London: Centre for Economic Policy Research; Warsaw and New York: Institute for EastWest Studies.

Shleifer, A. and D. Treisman. 2000. *Without a Map: Political Tactics and Economic Reform in Russia*. Cambridge, Massachusetts: MIT Press.

Slemrod, J. 1992. *Why People Pay Taxes: Tax Compliance and Enforcement.* Ann Arbor: University of Michigan Press.

Surrey, S. 1964. Tax Administration in Underdeveloped Countries. In Richard Bird and Oliver Oldman, eds., *Readings on Taxation in Underdeveloped Countries.* Baltimore, Maryland: John Hopkins Press.

Tait, A.A., Wilfrid L. M. Gratz and B.J. Eichengreen. 1979. International Comparisons of Taxation for Selected Developing Countries, 1972 – 1976. *IMF Staff Papers*, 26: 123 – 156.

Tanzi, V. 1993. *Transition to Market: Studies in Fiscal Reform.* Washington, D.C.: International Monetary Fund.

Tanzi, V. 1987. Quantitative Characteristics of the Tax Systems of Developing Countries. In David Newbery and Nicholas Stern, eds., *The Theory of Taxation for Developing Countries,* Washington, D.C.: Oxford University Press for the World Bank.

Treisman, D. 1999. Russia's Tax Crisis: Explaining Falling Revenues in a Transitional Economy. *Economics and Politics*, 11: 145 – 169.

Whalley, J. 1975. Distortionary Factor Taxation - A Calculation of Effective Tax Rates in the UK 1968-70. *The Manchester School,* 43: 1 – 30.

Table 5: Data Sources for the 25 TEs

Country	Tax Rates	Tax Payments	GDP	Capital and Labour Income
Albania	IBFD; EBRD	IMF1	IMF2	NA
Bulgaria	IBFD; EBRD	IMF1	IMF2	NSO
Croatia	IBFD; ERBD	IMF1	IMF2	NA
Czech Republic	IBFD; EBRD	IMF1	IMF2	NSO
FYR Macedonia	IBFD; EBRD	IMF1	IMF2	NA
Hungary	IBFD; EBRD	IMF1	IMF2	NSO
Poland	IBFD; EBRD	IMF1	IMF2	NSO
Romania	IBFD; EBRD	IMF1	IMF2	NSO
Slovak Republic	IBFD; EBRD	IMF1	IMF2	NSO
Slovenia	IBFD; EBRD	IMF1	IMF2	NSO
Armenia	IBFD; EBRD	IMF1; CIS	IMF2; CIS	CIS
Azerbaijan	IBFD; EBRD	IMF1; CIS	IMF2; CIS	CIS
Belarus	IBFD; EBRD	IMF1; CIS	IMF2; CIS	CIS
Estonia	IBFD; EBRD	IMF1	IMF2	NSO
Georgia	IBFD; EBRD	IMF1: CIS	IMF2; CIS	CIS
Kazakhstan	IBFD; EBRD	IMF1; CIS	IMF2; CIS	CIS
Kyrgyzstan	IBFD; EBRD	IMF1; CIS	IMF2; CIS	CIS
Latvia	IBFD; EBRD	IMF1	IMF2	NSO
Lithuania	IBFD; EBRD	IMF1	IMF2	NSO
Moldova	IBFD; EBRD	IMF1; CIS	IMF2; CIS	CIS
Russia	IBFD; EBRD	IMF1; CIS	IMF2; CIS	CIS
Tajikistan	IBFD; EBRD	IMF1; CIS	IMF2; CIS	CIS
Turkmenistan	IBFD; EBRD	IMF1; CIS	IMF2; CIS	NA
Ukraine	IBFD; EBRD	IMF1; CIS	IMF2: CIS	CIS
Uzbekistan	IBFD; EBRD	IMF1; CIS	IMF2; CIS	CIS

Notes: IBFD = International Bureau of Fiscal Documentation's *European Tax Handbook*
IBRD = European Bank for Reconstruction and Development's *Transition Reports*
IMF1 = International Monetary Fund's *Government Finance Statistics Yearbook* (*GFSY*)*
CIS = Statistical Committee of the Commonwealth of Independent States *Statistical Yearbook**
IMF2 = International Monetary Fund's *International Financial Statistics Yearbook**
NSO = various National Statistics Offices' *Statistical Bulletin*
NA = Not Available

* An alternate source used is the International Monetary Fund's *Staff Country Reports* / *Recent Economic Developments* for the various countries