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*Politics and Entrepreneurship  
in Transition Economies*

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NOT FOR QUOTATION

## **Politics and Entrepreneurship in Transition Economies<sup>1</sup>**

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### I. Introduction.

The economies of Eastern Europe and the former Soviet Union (FSU) escaped communism with a heavy burden. Despite the collapse of central planning, these economies continued to suffer from heavy political control of economic activity, reflected in massive subsidization of state firms, heavy regulation of entry and operations of private firms, as well as punitive taxation by the government and -- separately -- by its agents (corruption). Such politicization of the economy had to be reduced significantly for small business formation and growth to begin. In recent years, some countries have succeeded in depoliticizing their economies much better than others. As this paper shows, these are the countries that also had the best growth records.

Politicization of economic life can be usefully thought of as retention of control rights over firms by politicians even when these firms are no longer state-owned (see Grossman and Hart 1986, Boycko, Shleifer and Vishny 1995). These rights may include regulatory powers over privatized and private firms, the ability to regulate and restrict entry, rights over the use of land and real estate that private businesses occupy, rights over determination and collection of taxes that businesses pay, rights of inspection and closure if regulations are violated, rights to control international trade that firms engage in as well as their foreign exchange transactions, and in some cases even the power to set prices. Typically, politicians use these rights to pursue their political goals, such as the maintenance of employment in certain firms, support of politically friendly and punishment of politically unfriendly entrepreneurs, maintenance of prices and so on (Shleifer and Vishny 1994). Politicians also use these rights to enrich themselves by offering firms relief from regulation in exchange for bribes (Shleifer

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<sup>1</sup> For helpful comments we thank Olivier Blanchard and seminar participants at MIT.

and Vishny 1993). The general effect of such politicization is to reduce profitability of doing business, and therefore to adversely influence entrepreneurial activity and economic growth.

During transition from communism, the adverse effects of politicization on growth manifest themselves in a number of ways. The most direct one is that, when profits or potential profits are removed from firms through regulation, taxation, or corruption, entrepreneurs choose not to start firms or expand less rapidly than they might otherwise. But entrepreneurs have another option, namely to operate unofficially. In transition economies, one of the principal consequences of politicization has been the growth of the unofficial economy relative to the official one, since firms that do not operate officially can avoid taxes and regulations, though probably not bribes. At the same time, these firms need to use the protection and other public services supplies by private institutions, including in some cases criminal organizations. In this paper, we show that politicization of economic life and the resulting reallocation of resources to the unofficial sector can have profound effects on the structure of a transition economy and on its rate of growth.

Specifically, we show that there are two important sources of instability, or non-convexities, associated with the possibility of operating unofficially. First, suppose that prohibitive government regulation and taxation forces firms into the unofficial economy. For a given size of the unofficial economy, the government collects some taxes, which may suffice to provide only a limited quantity of public goods, such as police protection. The low supply of public goods in turn reduces the efficiency of the official sector, which has an adverse effect on the official tax base, tax collections, and hence public good supply for a given size of the unofficial economy.

But there is a second non-convexity as well. Specifically, as the provision of public goods in the official economy deteriorates, more firms choose to move into the unofficial economy, which further reduces the tax base and the resources of the public sector and hence its ability to provide public goods. This process too can lead to extreme outcomes, in which all of the economy converges to the unofficial sector. In section II, we present a simple model which illustrates both of these sources of instability.

Our work can be thought of as complementing Blanchard's (1997) analysis of growth of transition economies, which stresses the creation of new private firms as the engine of growth. Unlike Blanchard, we focus on the political determinants of the entrepreneurial response, and in particular on the allocation of resources between the formal and the informal sectors of the economy. The idea that depoliticization, in the form of

regulatory and tax relief, the resulting lower levels of corruption, and the elimination of political influence of firms obtained through subsidies, has been developed most explicitly by Frydman and Rapaczynski (1991), Boycko, Shleifer and Vishny (1995, 1996), and Shleifer and Vishny (1994). Our paper continues in this tradition, and in particular focuses on the implications of excessive regulation and taxation on the government's budget and the provision of public goods.

The empirical analysis of the determinants of growth in transition economies has largely focused on the effects of stabilization (Aslund, Boone, and Johnson 1996, Fischer, Sahay, and Vegh 1996, Denizer, de Melo, and Gelb 1996, and Sachs and Warner 1996). Several of these studies also recognize the importance of liberalization for the efficiency of the economy and therefore for growth. We elaborate the existing literature in three distinct ways. First, we focus on some of the mechanisms through which political control reduces growth, including most importantly the role of the unofficial economy in the transition (Kaufmann 1994, 1995, and 1997). While this point seems obvious, it is usually ignored in otherwise comprehensive recent studies of reform. The World Bank's World Development Report (1996), the EBRD's Transition Reports (1995) and (1996), and the IMF (as seen in Citrin and Lahiri 1995, and Fischer, Sahay, and Vegh 1996a and 1996b) do not offer any systematic estimates of the unofficial economy and all their analysis of performance deals only with officially recorded activity.<sup>2</sup>

Second, we focus on the consequences of the escape by new firms from the official economy on the budget, and hence on the provision of potentially beneficial public goods. A key public good in transition appears to be law and order. We look at the effects of the legal system on economic growth, both as officially measured and including our estimates of the unofficial economy.

Finally, we revisit the evidence on the beneficial effects of stabilization on growth. We do not believe that it is possible, from the available data, to conclude when stabilization has a direct benefit for growth, or is just coincidental with other aspects of depoliticization, since most countries that have stabilized have also liberalized considerably. The positive effects for entrepreneurship of stabilization and liberalization combined

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<sup>2</sup> The unofficial economy under the planned system was studied in detail, particularly by the Berkeley-Duke series discussed below. Leitzel (1995) analyzes changes in the character of unofficial activities in Russia as a result of reform.

were documented at length by Johnson and Loveman (1995) and are now well established.<sup>3</sup> However, some recent evidence from Russia in particular, where unlike in Eastern Europe stabilization has advanced significantly ahead of depoliticization, suggests that stabilization is at best not the whole story behind growth (see Frye and Shleifer 1997, and Shleifer 1997 for a comparison of Russia and Poland along these lines). Our analysis suggests caution in interpreting the evidence on stabilization.

In the next section of the paper, we present a simple model. Section III describes our data, and section IV then presents the evidence on the effects of political control on the unofficial economy. Section V focuses on the determinants of growth. Section VI revisits the data on stabilization, and section VII concludes.

## II. A Simple Model.

The model captures in the starkest way some of the ideas described in the introduction. We consider the allocation of labor between the formal and the informal sectors of the economy. The government imposes taxes on the formal sector, and provides public goods from the tax revenues. These public goods, such as law and order, increase the productivity of firms in the formal sector. The informal sector does not pay taxes, but it also does not have access to the public goods provided by the government. Instead, private protection agencies such as the mafia charge the informal sector fees to provide it with some public goods, such as protection and contract enforcement. The quality of that protection as well depends on the revenues raised by the private protection agencies. We examine the allocation of labor between the two sectors, and the implications it has for tax revenues, law and order, and the efficiency of the economy.

Denote by  $t$  the generalized tax rate on output in the formal sector. Here  $t$  includes taxation, regulation, and perhaps corruption. In the model taxes raise revenue for the government, but some of the generalized taxes in reality, such as regulation and corruption, do not. We discuss this distinction later. For now, however, let  $t$  be the share of output that the government in various ways removes from firms in the formal sector, and obtains for its budget. Let  $s$  denote the corresponding generalized tax rate in the informal sector, charged by the private

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<sup>3</sup> For a formal framework to analyze optimal reform in the presence of complementarities (e.g., between stabilization and liberalization), see Friedman and Johnson (1996).

law and order enforcers, which we loosely refer to as the mafia. As with the formal sector, collections from  $s$  enter the mafia's budget.

Let  $T$  be the tax revenues in the formal sector, and  $S$  be the tax revenues in the informal sector. Let  $Q$  be the quantity of the public good, such as law and order, in the formal sector, and  $R$  be the corresponding quantity in the informal sector. Let  $L$  be the aggregate labor force, and let the wage rate be normalized to 1. Finally, let  $F$  and  $I$  be the subscripts denoting the formal and the informal sectors respectively, so  $L_F$  and  $L_I$  is the labor employed in the two sectors,  $\Pi_F$  and  $\Pi_I$  is the profit in the two sectors, and  $Y_F$  and  $Y_I$  is the output in the two sectors.

Consider the formal sector first. The production function in this sector is assumed to be given by:

$$(1) Y_F = QL_F,$$

so the quantity of the public good directly enhances the productivity of the formal sector. As a consequence, after tax profits in this sector are given by:

$$(2) \Pi_F = (1-t)QL_F - L_F.$$

We assume that the supply of public goods is increasing and concave in tax revenues  $T$ , i.e.  $Q = Q(T)$ , with  $Q' > 0$  and  $Q'' < 0$ . We are not assuming that government resources are spent entirely on the provision of public goods; indeed, most of them might be stolen or wasted. We only assume that at least some share of the marginal dollar gets used for public good provision.

From the government's budget constraint, we get that  $Q = Q[tQL_F]$ . We can rewrite this eliminating  $Q$  from the right hand side as  $Q = q(tL_F)$ . For  $q$  expressed only as a function of  $tL_F$ , it is easy to verify that  $q' > 0$  and in some cases  $q'' > 0$ . This is the first possible increasing return in our model: as public good provision increases, so does the productivity of the private sector and the tax revenues collected from it, which enables a further increase in public good provision. The  $q$  function exhibits increasing returns if the government is sufficiently productive in converting revenues into public goods. For example, if  $Q(T) = T^\alpha$ , and  $\alpha > 1/2$  then  $q'' > 0$ . An identical argument for the informal sector shows that under comparable conditions  $R = r(sL_I)$ , where  $r' > 0$  and  $r'' > 0$ . These increasing returns are not, however, what we focus on.

We next examine the nature of equilibrium in the labor market, where  $L_I + L_F = L$ . In general, there are three equilibria in this model: one in which all resources are concentrated in the formal sector, one in which all

resources are in the informal sector, and a knife-edge equilibrium in which the two sectors coexist. The reason for the existence of the extreme equilibria is independent of the possible convexity of the  $q$  and  $r$  functions, i.e. there is a second, and totally separate source of increasing returns to sector size. When all resources are concentrated in the informal sector, government tax collections in the formal sector are zero, hence the amount of the public good supplied in that sector is zero, and hence the productivity of that sector is zero. As a consequence, all firms choose to stay in the informal sector. Similarly, if all resources are concentrated in the formal sector, the mafia's revenues do not enable it to provide any protection, and hence firms choose to stay in the formal sector. The forces causing the multiplicity of equilibria in this model are general even if, as we discuss below, more realistic specifications would generate less extreme outcomes. In fact, the second source of increasing returns is close to that analyzed by Blanchard and Summers (1987).

To examine the intermediate equilibrium, we actually need to assess the profits of the marginal firm that is indifferent between being in the formal and the informal sectors. This firm takes aggregate employment in the two sectors,  $L_F$  and  $L_I$  as given. Its marginal profit in the formal sector is given by  $(1-t)q(tL_F) - 1$ , and its marginal profit in the informal sector is  $(1-s)r(sL_I) - 1$ . In equilibrium, we must have that:

$$(3) (1-t)q(tL_F) = (1-s)r(sL_I).$$

For a given set of tax rates  $t$  and  $s$ , there generally exist  $L_F$  and  $L_I$  adding up to  $L$  that solve equation (3). However, this equilibrium is unstable. Starting from this equilibrium, if a firm tips over from the informal to the formal sector, the resources of the formal sector rise, hence so do tax collections and the quantity of public goods supplied, and finally the productivity in that sector. More firms would then choose to tip over into that sector, and the equilibrium would unravel.

To interpret this model, it is probably better to think of an augmented example in which some firms, for reasons outside the model, choose to operate in the formal sector (e.g., state firms or firms dealing extensively with the state), and other firms choose to operate in the informal sector (e.g., what they produce is illegal). In such a model, the forces we describe still operate, but both sectors coexist in equilibrium. What does our analysis tell us about such situations?

The first key point is that high tax and especially regulatory rates tend to destroy the formal sector. Excessively high rates drive firms into the informal sector, thus undermine tax collections, and reduce



productivity in the formal sector. We note in this regard that high regulatory “taxes” are much worse than high taxes proper, since they have all the distortionary effects without bringing in any revenues. Corruption and regulation are much worse than taxes because they undermine the tax bases without improving the budget.<sup>4</sup>

The second key point is that we would in general find more firms in the officially registered private sector when the government is more efficient than the mafia at providing (official sector) public goods such as law and order. In this case, firms will be efficient in the formal sector, tax collection will be high, and the corner formal equilibrium may be the most likely outcome. The converse holds when the government fails at providing law and order.

In principle, in this model, a well organized government can always beat the informal sector if this government has access to a superior technology of providing public goods. After all, it can always set  $t = s$ , and still get firms to strictly prefer the formal sector. To the extent that the mafia cannot make credible commitments, the government might actually have access to a superior tax policy. However, in transition economies, it is not obvious that the government is always superior. First, as we already mentioned, the government often spends a lot of its revenues on activities other than the provision of public goods, i.e., it might have a bigger leakage than the mafia. Second, the government might even for socially efficient reasons choose to regulate more than the mafia does. But third, and perhaps most important, governments in some transition economies are disorganized and not in control of themselves. As a consequence,  $t$  is not set by one unified government -- even a unified revenue maximizing government -- but by a collection of agencies and levels of government that impose taxes, bribes, and regulations largely independently of each other (see Shleifer and Vishny 1993). In effect,  $t$  in transition economies can be a lot higher than is optimal, which would significantly undermine government’s tax revenues and hence its ability to supply public goods.

In summary, the model if somewhat broadly interpreted has a number of implications for empirical work. It suggests that transition is likely to follow one of two paths. Some countries would be characterized by: relatively high tax revenues; low burden from taxes, regulations, and corruption; high quantity of public goods

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<sup>4</sup> The effects of corruption on resource allocation depend on whether corruption affects firms in the formal or informal sector more. If informal sector firms are particularly susceptible to corruption and if the marginal cost of corruption increases with the size of the informal sector, corruption can, in principle, prevent the complete reallocation of activity to the informal sector. See Kaufmann (1995), Kaufmann and Siegelbaum (1997), and Shleifer and Vishny (1993).

provided by the government; small informal sectors; and presumably -- if the formal sector grows more rapidly - higher growth rates. Other countries would be characterized by a higher burden from taxes, regulation, and corruption, lower tax collections, low quantity of public goods provided by the government, large informal sectors, and presumably lower growth. Importantly, the adverse effect of low  $Q$  is primarily on growth in the formal sector. In our empirical work, we try to get some estimates of  $t$  and  $Q$ , as well as those of the size of the formal and informal sectors (Section III). We then examine the relationship between  $t$  and  $Q$  on the one hand, and the size of the informal sector (Section IV) and growth on the other (Section V).

Before we present the data, an important caveat is in order. A key assumption in our model is that entrepreneurs are free to switch resources from the official to the unofficial sector in order to lower their tax burden. If there is strong political repression, the government may be able to punish (through noneconomic means) anyone who leaves the formal sector. For example, it can use its tax revenue to fight the mafia, something we do not model. Similarly, if the government is itself indistinguishable from the mafia it may be able to impose high marginal taxes on both formal and informal activities, thus making any switch unattractive. Although we do not model this possibility explicitly, both Belarus and Uzbekistan appear to be outliers in the data precisely because their states are more repressive and more corrupt.

### III. Data

The predictions of our model concern the effects of taxes, regulation, and the provision of public goods on the “unofficial” economy and on growth. This section discusses our data sources and explains in general terms how we use the available information to develop both measures of performance, particularly the unofficial economy, and indicators of reforms.

#### *Unofficial Economy*

As used here, the “unofficial economy” constitutes activity which is not reported to the state statistical office. For obvious reasons, it is almost never reported to the tax authorities. In previously communist countries, published GDP figures rarely capture any of this activity. Estimates of the unofficial

economy are available for particular countries, but the methodologies employed differ widely and no comparable estimates are provided by any reputable national or international organization.<sup>5</sup>

We use data on electricity consumption to compare unofficial activity across countries. Electricity consumption offers a rough measure of overall economic activity; around the world, the short-run electricity-to-GDP elasticity is usually close to one.<sup>6</sup> Measured GDP by definition captures only the official part of the economy, so the difference between overall and measured GDP gives an estimate of the size of the unofficial economy.

Assuming a unit elasticity may underestimate overall GDP and the size of the unofficial economy for four reasons. There is some improved efficiency in electricity use over time, particularly given the very low initial efficiency; higher electricity prices reduce consumption per unit of output; there may be a shift of the output mix away from electricity-intensive industries (both within existing enterprises and with the creation of new businesses); and there may be increased underreporting of electricity consumption, although the amount of electricity stolen is small and probably does not vary over time. On the other hand, a unit elasticity assumption would overestimate the size of the overall economy if electricity use is primarily for “overhead” activities, like lighting buildings. Energy efficiency may also worsen due to neglect of essential maintenance and some substitution of electricity for other energy sources (e.g., a switch to electric heating from gas heating).

On balance, the unit elasticity assumption probably leads to a small underestimate, and the most important effect is likely to have been the increasing relative price of electricity. We make the conservative assumption that some countries have become even more energy-inefficient during the transition at the same time as other countries have become more energy-efficient in response to energy price increases. Differences in energy efficiency across countries in the region appear to result primarily from divergent energy prices.

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<sup>5</sup> For example, for 1996 in Russia Goskomstat estimated the unofficial economy to be about 20 percent of total activity. For a critique of their methodology, see *Russian Economic Trends*, March monthly update, 1997.

<sup>6</sup> Dobozi and Pohl (1995) assume a unit elasticity in all their calculations. A number of criticisms have been leveled against this assumption; in particular, see Koen (1995) and Freinkman (1995). Taking these criticisms into account, we analyze the data making a variety of assumptions, in particular that electricity price increases may reduce electricity consumption.

Generally, estimates for the price elasticity of electricity consumption are in the 0.05 to 0.15 range.

Nonetheless, while the price elasticity may be low, the efficiency implications of large price adjustments can still be significant.

Drawing on the work of Gray (1995), Freund and Wallich (1995), and discussions with other World Bank energy experts, Kaufmann and Kaliberda (1996) developed a simple tiered classification of ex post output elasticity for electricity consumption: the “energy efficient” economies, comprising the Central/East European countries where energy price adjustments have been more significant and started earlier, which are assumed to have an output elasticity of electricity consumption of 0.9 when their economies began to grow again; the “energy neutral” economies, comprising the Baltics where price adjustment has taken place but started later, which are assumed to have a unitary elasticity of electricity consumption; and the “energy inefficient” economies, comprising the rest of the former Soviet Union with relatively late and little price adjustment, which are assumed to have an output elasticity of electricity consumption of 1.15.<sup>7</sup> Our regressions use this conservative assumption, which tends to hold down our estimate of the unofficial economy. We have rerun our regressions using the “unit elasticity” assumption but have not found any notable difference.

Over time we would expect the relationship between electricity consumption and output to break down, both due to dramatic improvements in energy efficiency or to large changes in reliance on electricity, as opposed to other energy sources. This breakdown appears to have begun for some countries in 1995. In that year electricity consumption was down sharply in Estonia, even though both official data and anecdotal evidence suggest the economy grew. Conversely, in Bulgaria electricity consumption rose over 10% even though the real economy appears on other evidence to have performed badly. We use performance data from 1994 rather than 1995 in our baseline regressions, although we also check whether our results hold in the 1995 data.

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<sup>7</sup> The elasticity will not usually be the same when output is falling and when it is rising. Assuming an elasticity of 1.15 for the relationship between energy consumption and output when output is increasing (because energy use is becoming less efficient) is equivalent to assuming an elasticity of 0.87 when output is falling (the inverse of 1.15). Similarly the assumption of an elasticity of 0.9 for Central-Eastern Europe when output is increasing (due to an improvement in energy efficiency) is equivalent to an elasticity of 1.11 when output is falling.

Changes in electricity consumption compared with changes in official GDP give us an estimate of the change in the size of the unofficial economy. To calculate a series for growth of the unofficial economy, we need to have an estimate of its initial, i.e. pre-reform, size. For these numbers we rely on the “Berkeley-Duke Studies of the Soviet Second Economy,” prepared under the supervision of Vladimir Treml and Gregory Grossman, mostly between 1986 and 1991, and on unpublished World Bank research.

These papers suggest the following share of unofficial activity in total activity in 1989 for East European countries: Bulgaria, 22.8 percent; Czech Republic and Slovakia, 6 percent; Hungary, 27 percent; Poland, 15.7 percent; and Romania, 22.3 percent. The initial pre-reform share of the unofficial economy in the total economy is estimated to have been 12 percent in all the former Soviet republics.

In addition to using the electricity data to estimate the unofficial economy’s size, we also recalculate the level of total GDP, i.e., official plus unofficial GDP. We use this information to examine the effect of policies on the total level of output, and to check the robustness of our and others’ results which are obtained using official GDP as the dependent variable.

There are 26 “transition” economies, but we are able to use electricity data from only 17: Bulgaria, Czech Republic, Hungary, Poland, Romania, and the Slovak Republic in East-Central Europe; Estonia, Latvia, and Lithuania in the Baltics; Russia, Ukraine, Moldova, and Belarus in the western part of the former Soviet Union; Azerbaijan and Georgia in the Caucasus; and Uzbekistan and Kazakhstan in Central Asia. We either could not obtain reliable information or were informed by World Bank economists there was no stable relationship between electricity consumption and output in: the countries formerly in Yugoslavia (where Croatia, Slovenia, and Macedonia are often included in studies of “transition”), Armenia, Turkmenistan, Tajikistan, Kyrgyzstan, and Mongolia.<sup>8</sup>

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<sup>8</sup> Serbia is not included in other studies of transition for reasons that are often unclear. We exclude it because we lack reliable data on both performance and policy.

## *Measures of Reform*

International organizations have made several attempts to evaluate the degree of reform in post-communist economies. We use sources that evaluate reform from somewhat different perspectives. Where the measures overlap, we can check that our results are not due to the biases of a particular organization. We discuss the particular measures in more detail as they are introduced in the analysis. Here we review the data sources themselves.

Denizer, de Melo, and Gelb (1996), based on discussions with World Bank country economists, have developed measures of internal liberalization, external liberalization, and “private sector development.” They provide both a score for each year and an overall “cumulative liberalization index,” which is the sum of all liberalization scores since 1989. This World Bank measure of “internal liberalization” is the best available measure of the extent to which prices are still subject to government control, and so we use it below. However, we rely on better documented sources to measure the extent of external liberalization and privatization.

The European Bank for Reconstruction and Development (EBRD), offers 10 measures of liberalization, divided into five categories: private sector share of GDP (in an unnamed category by itself); large-scale privatization, small-scale privatization, and enterprise restructuring (the “enterprises” category); price liberalization, trade and foreign exchange system, and competition policy (the “markets and trade” category); banking reform and interest rate liberalization and securities markets and non-bank financial institutions (the “financial institutions” category); and extensiveness and effectiveness of legal rules on investment (these are provided together as the “legal reform” category in the summary table and separately in a subsequent table: Table 6.1, p. 103 in EBRD 1995, and Box 2.1 in EBRD 1996). Each country is given one of five scores from 1 to 4\*, with a higher score indicating more reform.

Of these measures, our regressions reported below use “large-scale privatization,” “trade and foreign exchange system,” “extensiveness of legal rules,” and “effectiveness of legal rules.” We tried regressions with “small-scale privatization” but did not find any difference in results from large-scale privatization. The

“enterprise restructuring” variable is rather vaguely defined and almost all countries get a score of either 2 or 3. Similarly, “price liberalization” is defined in such a way that all countries score 3, except Turkmenistan, and for this reason we prefer the World Bank index described above. Competition policy and the financial institutions measure are not directly relevant for this paper.

For reasons discussed earlier, our preferred economic performance data are for 1994 rather than 1995. However, our policy measures, both from the EBRD and other organizations discussed below, are for 1995 or 1996. Given that the EBRD’s Transition Report is prepared during the year it is published, this seems to be only a minor problem (i.e., at most the performance measure may refer to a period 6 months before the period for which the policy measure applies). Furthermore, given that almost all the countries in our sample experienced relatively little structural change and almost no change in relative ranking in terms of “reform level” between 1994 and 1995, using the data in this way seems reasonable.<sup>9</sup>

For macroeconomic variables we rely on the International Monetary Fund (IMF) for GDP, budget deficit as a percent of GDP and log inflation.<sup>10</sup> These measures seem relatively uncontroversial and results using earlier versions of these data were published in Fischer, Sahay and Vegh (1996).<sup>11</sup> We obtained updated data through private correspondence and understand it to represent the latest official IMF estimates through the end of 1996 (Sahay 1996).

In addition to the data provided by international organizations, we use four independent assessments of the extent and nature of reform. For three years, 1995-97, the Wall Street Journal’s Central European Economic Review (CEER) has asked a panel of western experts, primarily from the investment community, to rate reform in transition economies on various dimensions. The panel composition differs each time and the

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<sup>9</sup>Appendix 2 suggests some movement in legal reform between 1994 and 1995, although this is probably due more to the different definition of indices by organizations providing the ratings.

<sup>10</sup> Inflation is used in logs to avoid distortion of the results due to Georgia’s very high inflation in 1994 and 1995.

<sup>11</sup> We looked at various measures of inflation and budget performance, for example available from the EBRD and the World Bank’s Office of the Chief Economist. The IMF appears to have the best series both in terms of comparability across countries and in terms of being revised to reflect retrospective reevaluations by both country statistical offices and the IMF itself. We would note, however, that there are at least two estimates of budget deficits for the former Soviet countries within the IMF itself (see Cheasty and Davis 1996, and Fischer, Sahay, and Vegh 1996).

questions they answer also vary. We look at the four measures which are relevant to our discussion: legal safeguards, crime and corruption, and tax burden (asked in 1996); and rule of law (asked in 1997). For more detail on these ratings see Appendix 1.

The Heritage Foundation offers ten measures of “economic freedom” for almost all countries in the world: trade policy, taxation policy, government consumption of economic output, monetary policy, capital flows and foreign investment, banking policy, wage and price controls, property rights, regulation policy, and black market (Johnson and Sheehy 1996, Chapter 3). Their regulation measure involves a considerable amount of judgment. There are comments attached to each rating but these are rather vague, such as for Ukraine in 1996, “The haphazard application of regulations is a significant barrier to business.” While the comments are generally reasonable, the ratings for this variable are quite idiosyncratic. For example, in 1996 Poland, Russia, and Belarus get the same score for “regulation,” which seems quite unreasonable, particularly because the criteria for this score (3) includes “no bribes,” which anecdotal and survey evidence clearly indicates is not the case in any of these countries (Frye and Shleifer 1997). The Czech Republic gets a 1 on regulation, the best possible score, which again seems implausible. We use this index with caution, in part as a possible check of our other results.

A further issue is that the 1995 ratings (largely based on observations in 1994) only cover 12 transition countries, including Mongolia for which we do not have reliable electricity data. To get a reasonable sample size, we rely on the 1996 ratings (primarily reporting on 1995) which cover 20 transition countries and all the 17 countries for which we have reliable electricity data except those in Central Asia (Kazakhstan and Uzbekistan). Comparing these “1996 ratings” with economic performance data from 1994 is not likely to create a large bias because most countries did not experience large changes in taxation or regulation between 1994 and 1995.<sup>12</sup>

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<sup>12</sup> There was relatively little change in these Heritage Foundation indices between 1994 (covered in the 1995 ratings) and 1995 (covered in the 1996 ratings) in the countries for which data on both years is provided. In the regulation index, between 1994 and 1995 the changes were for Hungary, Slovakia and Russia (all of which moved from a score of



While there are differences between these ratings, on the whole experts agree at least in their rankings of "extent of reform." For example, Aslund, Boone, and Johnson (1996) compared four sets of rankings of former Soviet countries from the World Bank, the International Monetary Fund, the EBRD, and Ernst & Young.<sup>13</sup> For 1994 and 1995, all four organizations agree that the five "most" reformed countries are Estonia, Latvia, Lithuania, the Kyrgyz Republic, and Russia, and that Turkmenistan, Tajikistan, and Azerbaijan had relatively little reform. Almost all countries have similar rankings in these four rating schemes, although Kazakhstan receives a higher position from the IMF and Ernst & Young than from the World Bank and EBRD.<sup>14</sup>

### *Control Variables*

Undoubtedly there are important structural differences between Central/Eastern Europe and the former Soviet Union which we need to take into account. The Soviet Union had a larger military-industrial production sector and its constituent countries suffered greater disruption to their trade following the fall of communism. The obvious way to control for these differences is using a dummy variable for belonging to the former Soviet Union, and all our regressions have been run using this variable.

On the other hand, it is also possible that, as predicted by our model, countries in the former Soviet Union have converged to a different equilibrium than the countries in Central Europe. For example, legal safeguards for investment are much lower for countries which belonged to the Soviet Union. If legal safeguards

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2 to 3, i.e., were deemed to have worsening regulations). In the taxation index, between 1994 and 1995 the changes were for Hungary (from 5 to 4), Romania (from 4.5 to 5), and Moldova (from 5 to 4.5).

<sup>13</sup> The World Bank rankings are from on the cumulative liberalization index of de Melo, Denizer, and Gelb (1996) which is described above. The IMF ranking is obtained from Citrin (1996, Table 1.2) which rates countries in the former Soviet Union in terms of fiscal consolidation, privatization and land restitution, government and institutional reform, legal framework (discussed further in appendix 2 below), social safety net, and trade liberalization. The EBRD ranking is from their indices described above. Ernst & Young ranks business opportunity, political risk, credit rating, status of economy, stability, and business infrastructure ("Survey of Business Locations in Europe," *Financial Times*, October 24, 1995, p.3.)

<sup>14</sup> The only important exception is Ukraine in 1994, for which the rankings differ widely. Ukraine began an impressive-looking reform program in November 1994 and the country's relative ranking should vary according to whether an assessment was made before or after this date. Unfortunately, we do not know the month in which rankings were compiled.

are a measure of the quantity of public goods, this may be a reflection of poor public finances as much as that of history. In our analysis, therefore, we try not to assume that the countries of the FSU are just different. Empirically also, including the former Soviet Union dummy introduces multicollinearity and makes our estimates inaccurate. In our baseline regressions, we therefore use a control variable which captures important differences in initial performance conditions. We subsequently rerun the regression using a regional dummy but interpret the results in light of our theoretical analysis.

We also control for the number of “years of reform” in checking our baseline regression results. The initial year of reform is taken as the “year of most intense reform” from Aslund, Boone, and Johnson (1996, Table 3), and set equal to zero.<sup>15</sup> We treat substantial price liberalization as the beginning of reform, which means that every country is assumed to have started reform by 1994.<sup>16</sup>

#### IV. Effects on the Unofficial Economy

Figure 1 shows the share of the unofficial economy and the tax burden (where a higher score means that the effective burden is lower). Aside from two countries, Belarus and Uzbekistan, a higher tax burden is strongly correlated with a higher share of the unofficial economy, just as the model predicts. In Belarus and Uzbekistan, however, the government has been able to sustain a high tax burden without a large part of the economy moving into the informal sector. Similarly, Figure 2 shows that the quality of public goods (measured by the extent of legal safeguards for investment) is higher where the share of the unofficial sector is lower.

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<sup>15</sup> Determining the first year of reform is uncontroversial for most countries. All members of the former Soviet Union (with the arguable exception of Lithuania and Estonia in the Baltics) clearly started reform in 1992, while Poland, Hungary, and Romania began in 1990, and Albania in 1992. Other countries could be interpreted to have begun in 1990 or 1991: Czech Republic, Slovakia, and Bulgaria. At least for the analysis in this paper, these differences in when reform “started” do not seem to affect the results.

<sup>16</sup> The main alternative way to date reform is according to when countries are deemed by the IMF to “have stabilized.” This method is used by Fischer, Sahay, and Vegh (1996) and by Hellman (1996). Using this measure in our cross-country regressions did not appear to make a difference and these results are not reported. However, this measure does have implications for the interpretation of individual country reform effects, most notably Russia is deemed to have “reformed” in April 1995 using this method, in contrast to January 1992 under the Aslund, Boone and Johnson (1996) timing. We discuss this point at length in Section V.

Again, Belarus and Uzbekistan are exceptions: they have poor quality public goods but relatively little of their economy has switched into the informal sector.

Figures 1 and 2, together with much other evidence, suggest that Belarus and Uzbekistan do not fit the framework of our basic model. In these two countries the state has remained sufficiently repressive or has become so completely entwined with the mafia that it is not possible for entrepreneurs to switch into the informal sector. Belarus and Uzbekistan appear to have completely different characteristics than the rest of the former Soviet Union and Eastern Europe. While we will continue to present the data on these two countries in our graphs, it makes more sense to omit them as observations in our regression analysis.

In examining the effects of political control on economic performance, our model suggests dividing the available policy measures into three categories. The first are measures of liberalization that might be interpreted as proxying for  $t$  in our model. These include measures of general liberalization (as a proxy for low  $t$ ), external liberalization (as a proxy for deregulation of foreign trade), privatization (which in some models, such as Shleifer and Vishny 1994, is directly linked to reductions of government control), regulation, and the taxation burden. One last measure of  $t$  we use is corruption, which definitely works as a tax on formal business, but is a bit harder to interpret since it often affects informal business as well as informal firms need to bribe bureaucrats to leave them alone.

In addition to using the various proxies for  $t$ , we attempt to directly measure the provision of public goods in the formal sector, namely  $Q$ . The particular aspect of  $Q$  we focus on are measures of legal and regulatory environment in different countries, since it is precisely in this area where formal sector firms derive the benefits of government services to a much greater extent than the informal sector firms do.

One of the central predictions of our model concerns the tendency toward multiple equilibria. A simple look at the data (see below) suggests that in transition economies there is indeed a strong difference between countries in the former Soviet Union and countries in Eastern and Central Europe in both the share of the unofficial economy and the growth rates. Formally, we attempt to test for the possibility of multiple

equilibria by controlling for the FSU status of a country. The prediction is that the FSU dummy must be strongly correlated with the independent variables proxying for the level of  $t$  or  $Q$ , and hence reduce their significance and itself explain the allocation of resources between the formal and the informal sectors, as well as growth. Unfortunately, we cannot disentangle the hypothesis of multiple equilibria from a broader hypothesis that suggests that FSU countries are different from the countries of Eastern and Central Europe for reasons of history and other initial conditions, so that by including a control we capture these omitted variables rather than non-convexities.

Returning to our theoretical caveat, recall that one important feature of reality that our model does not capture is that a regressive government can impede the flow of resources into the informal sector by fighting the mafia or the informal businesses directly. In particular, we do not expect Belarus and Uzbekistan to exhibit the same features as other former Soviet countries.

#### *The Share of the Unofficial Economy*

Table 1 shows the results of estimating the share of the unofficial economy in total GDP using the electricity consumption-based methodology explained above. The raw data strongly suggests the presence of two divergent development paths. The average unofficial share in East European countries starts at 16.6 percent, peaks at 21.3 percent in 1992, and falls to 19.0 percent by 1995. In contrast, the unofficial share in former Soviet countries starts at 12.0 percent and rises to 36.2 percent in 1994 before dropping to 34.4 percent in 1995. Even more striking is the contrast between Poland and Romania on the one hand, with a fall in the unofficial economy share 1989-95 of around 3 percent, and Russia and Ukraine on the other, where the unofficial economy share rose 29.6 percent and 36.9 percent respectively over the same period. Note that in both Belarus and Uzbekistan the share of the unofficial economy is low and either has hardly increased (Belarus) or has actually declined (Uzbekistan), consistent with our notion that the state in these countries has suppressed the informal sector.

Adjusting for the unofficial economy implies a substantial revision in GDP numbers for some countries, also shown in Table 1. For example, we estimate that Russian GDP in 1994 was actually around 75 percent of its 1989 level, rather than the 51.3 percent indicated in official statistics. The nature of our correction is such that the countries with the greatest fall in official GDP from 1989 to 1995 receive the largest upward correction in our total GDP estimates. For example, Georgian GDP in 1994 is estimated to be 37.6 percent of its 1989 level, not the 15.6 percent suggested by official statistics, while our estimate of total GDP (1994 relative to 1989) for Poland is actually slightly less than the official number. This direction of the correction should be kept in mind when interpreting empirical results in section V.

#### *Taxation, Regulation, and Corruption*

Table 2(a) shows the results from regressions of the “share” of the unofficial economy on the measures of state control over the economy in a cross-section of 15 countries. A negative coefficient implies that a higher value for this variable is correlated with a larger share of the unofficial economy in total GDP. In the first column for each variable we report results for OLS regressions with only the state control variable and a constant. In the second column, we include a dummy for belonging to the “former Soviet Union” and in the third column we control for the country’s initial (pre-reform) share of unofficial activity.

The first independent variable is the World Bank measure of internal liberalization, which lies between 0 and 1, with a higher value representing more liberalization. This variable is significantly correlated with the unofficial share of the economy and this result is not affected by using a dummy for the former Soviet Union. An increase of 0.1 in this index would raise the share of the unofficial economy by around 6 percentage points.

We next report results for the EBRD’s measure of “external liberalization,” which lies between 0 and 5, with a higher score representing more foreign exchange and trade liberalization. This variable is significant by itself and when we control for “initial share.” A one point increase in this index reduces the share

of the unofficial economy by 6.5-7 percentage points, and the countries range from 2 to 5 in terms of this measure.

We also find a strong result for privatization. The EBRD measures “large-scale privatization” on its usual scale of 0 to 5, with a higher score meaning more privatized. This policy variable is negatively correlated with the unofficial share, and the coefficient suggests that a one point increase in the score of large-scale privatization is associated with a 6.7 percent reduction in the share of the unofficial economy. Again, when we use the former Soviet Union dummy instead of the initial unofficial share, this result becomes weaker.

The Wall Street Journal’s measure of tax burden is also significant with the predicted sign in the regression. A higher score indicates a lower tax burden, i.e., lower effective tax rate, so the negative coefficient means that less onerous taxes are associated with a lower share of the unofficial economy in total activity. As Figure 1 shows, leaving Uzbekistan and Belarus aside, there is a negative relationship between this index of the tax burden and the share of the unofficial economy, as predicted in our model.<sup>17</sup> Specifically, this evidence supports the proposition that higher tax rates drive firms into the unofficial economy.

Two measures of “taxation without government revenues” are corruption and regulation. Our proxy for corruption is the Wall Street Journal’s evaluation of “crime and corruption.” This measure of corruption is significant with the expected sign when used in the share regression. A one point improvement in the crime and corruption index (which ranges from 1 to 10), i.e. a reduction in corruption, reduces the share of the unofficial economy by 4.7 percentage points.

A one point increase in the Heritage Foundation’s regulation index (which ranges from 1 to 5), i.e. worse or more stringent regulations, raises the unofficial economy share by 11.2 percentage points (if we control for the initial share of the unofficial economy.) Figure 3 provides visual confirmation of the positive

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<sup>17</sup> The Heritage Foundation’s taxation index (where higher means a greater effective tax rate) is not significantly correlated with the unofficial share of the economy. The Wall Street Journal and Heritage Foundation estimates of tax burden vary widely. In the Heritage Foundation measure, tax burden is relatively high (a score of 4 out of a potential 5) in economies with a relatively low share of the unofficial economy, such as the Czech Republic and Hungary, and in those with a relatively high share, such as Russia and Azerbaijan. Belarus and Uzbekistan are the outliers in the CEER measure, with high effective taxation and low share of the unofficial economy.

relationship between regulation and the share of the unofficial economy.<sup>18</sup> There is a similar relationship between the extent of corruption and the share of the unofficial economy.

### *The Legal Environment*

Table 2(b) shows the correlation between the four measures of the legal environment and the share of the unofficial economy. A higher score means a “better” environment for official business. These measures can be thought of as proxying for the variable Q in our model, i.e. the supply of public goods in the official sector.

The first two measures are the results of evaluations by two different panels for the Wall Street Journal, the first on “legal safeguards for investment,” and the second more generally on the “rule of law.” The third measure is from the EBRD (1995, p.103 and 1996, p.14) evaluates the countries in terms of the de jure extensiveness of their legal systems in protecting investment. The fourth measure, also from the EBRD (1995, p.103 and 1996, p.14), assesses the de facto effectiveness of legal systems in terms of protecting investment.

All the measures have the predicted sign and are significant in explaining the share of unofficial economy. This is strong support for the theoretical prediction that the unofficial economy is larger where the official sector’s public goods are poorer, and particularly where the rule of law is weaker. A one point increase in the index of legal safeguards (which ranges from 1 to 10) is associated with a 5.1 percentage points fall in the share of the unofficial economy, and a change in the rule of law index has only a slightly smaller effect. The legal effectiveness and extensiveness indices have a similar size effect, although it is hard to compare precisely because their range of values is from 1 to 5. The first three measures of legal environment retain their significance if we use the FSU dummy, but the effect becomes weaker -- consistent with the existence of multiple equilibria.

The hypothesis of multiple equilibria gains strong support from these results. Eastern Europe (and the Baltics) have a significantly higher “rule of law” than does the Commonwealth of Independent States (CIS is

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<sup>18</sup> The regulation index in Figure 3 is from the Heritage Foundation which does not provide a rating for Uzbekistan. Their rating of Belarus at the same level as Poland, and better than Russia and Ukraine, is surprising and hard to justify.

the former Soviet Union minus the Baltics.) In the CEER measure only one East European country, Bulgaria, has a lower rule of law measure than the best CIS country, Moldova, and the difference is very small. The difference in Figure 2 is even more striking: the lowest legal safeguards in non-CIS countries are in Romania with a score of 5.6, and the highest legal safeguards in the CIS are in Moldova with a score of 4.3. This strongly suggests the presence of multiple equilibria with the CIS countries having a lower rule of law. Notice, however, that again Uzbekistan and Belarus are outliers because they have a low quality legal environment but a low share of the unofficial economy. (Figure 4 shows a similar result using the EBRD's measure of "legal effectiveness.")

Table 3 shows that "legal safeguards," "rule of law," and "crime and corruption" are positively related to the measure of tax burden, i.e., higher effective tax rates are correlated with lower legal safeguards for investment, weaker "rule of law," and more corruption.

#### *The Relationship Between Taxation and the Quality of Public Goods*

Our model makes three predictions about public finance. First, tax revenues should be lower when tax rates are too high. Second, if tax revenues and government spending are correlated (i.e. if the government cannot finance the difference with borrowing), then spending should be lower when tax rates are too high. Third, lower levels of government spending should be correlated with lower quality public goods and a high share of unofficial activities in the economy.

With the exception of Uzbekistan and Belarus, Figure 5 confirms that tax revenue (as a percent of total GDP, including the unofficial economy) is a negative function of the tax burden, defined to include both rates and the way the tax system is administered. Starting with very high effective taxes, a lowering of tax rates (an increase in the Wall Street Journal's "tax burden" index) actually increases revenue. Thus tax revenue is high in the Czech Republic and Poland (with a low tax burden). Russia has a medium tax burden, but not low enough to get a recovery in tax revenue. Uzbekistan and Belarus are anomalies because a high level of political



repression enables them to keep firms in the formal sector (and therefore maintain revenue) even though the tax burden is high and the level of public goods provision is low.

Figure 6 shows the time series of tax revenues over total GDP for Russia and Poland. In Poland revenues initially fell with reform, but then increased. In Russia they continue to fall and are now under 20 percent of total GDP. In principle, governments could use deficit financing to breach the gap between taxes collected and spending on public goods. In practice, at least for these transition economies, this does not happen. Figure 7 shows that tax revenues are highly correlated with government spending.

Appendix 4 shows the available numbers on general government spending as a percent of both official and total GDP. There is a marked difference between Eastern Europe and CIS countries. General government spending in Poland was 48.8 percent of GDP in 1989, 39.8 percent in 1990, and 47.5 percent in 1994 (EBRD 1996, p.201); in the Czech Republic it was 60.1 percent in 1990 and 50 percent in 1994 (EBRD 1996, p.191); and in Hungary it was 53.5 percent in 1990 and 56.1 percent in 1995. In contrast, Russian government spending fell from 60.5 percent of official GDP in 1992 to 31.9 percent in 1995 (see Appendix 4). If we compare general government spending as a share of total GDP, for the latest available year this was around 40 percent for Poland (1994) and under 20 percent for Russia (1995). A large decline in general government spending as a percent of GDP appears to have occurred in the CIS countries, not in Eastern Europe and not in the Baltics. Table 4 shows government spending is positively correlated with quality of legal safeguards (the level of Q) and with the extent of liberalization (Figure 8 shows the relationship with tax revenue). Table 5 shows that higher spending, which is presumably associated with a higher supply of public goods, is correlated with a lower share of unofficial activity in total GDP. Also striking is the positive correlation between spending as a percent of GDP and growth. Even though these economies have high average spending, higher spending implies faster growth. A plausible mechanism is through the provision of public goods to the official sector.

Relating these results back to taxation,  $t$ , in our model, Figure 1 shows the share of the unofficial economy is a positive function of tax burden. A lower tax burden (a higher value of the Wall Street Journal tax burden index) leads to a fall in the share of the unofficial economy. Figure 9 confirms that a more effective state, in terms of government expenditure as a percent of GDP, is associated with a lower share of the unofficial economy. The exceptions to these relationships (and to our model) are Uzbekistan and Belarus because of their unusually high level of political repression.

### *Summary*

Regression results using share of the unofficial economy on the left hand side confirm our theoretical predictions for both the tax rate,  $t$ , and public goods in the state sector,  $Q$ . Liberalization and privatization are both negatively correlated with the share of the unofficial economy, i.e., “more reform” in either of those dimensions is associated with a higher percentage of activity in the official sector.

As predicted by our model, the share of the unofficial economy appears to be a negatively correlated with our index of the tax rate burden. In these countries, higher effective tax rates are associated with lower quality public goods. The presence of this effect is further confirmed by the results which show that higher effective tax rates (a lower score in the CEER measure of “tax burden”) are actually correlated with lower legal safeguards for investment, lower “rule of law”, and more “crime and corruption”. Belarus and Uzbekistan are important exceptions which can be explained by their very high levels of political repression.

There is a strong negative relationship between all measures of the legal protection for investment and the share of the unofficial economy. This strongly supports our theoretical proposition that the unofficial sector is larger when the quality of public goods in the official economy is lower.

## V. Effects on Growth

This section examines whether tax burden,  $t$ , and the supply of public goods,  $Q$ , are also correlated with output growth across countries. Two measures of performance are available: officially measured GDP, and “total” GDP adjusted for the likely size of the unofficial economy. Our model predicts that the effects of  $t$  and  $Q$  should be strongest on official GDP, because  $t$  and  $Q$  directly affect firms in the official sector. There will be an effect on total GDP only if the informal sector is less efficient than the formal sector, which is a second order effect.

We use three dependent variables. We examine two measures of GDP: official output in 1994 for each country (an index with 1989 equal to 100), and total output in 1994 (an index with 1989 equal to 100) including our measure of the unofficial economy. Examining the GDP level in 1994 should capture cumulative performance better than the growth rate in any one year. We also use a measure of entrepreneurial development as a dependent variable.

Just as in the analysis of the share of the unofficial economy, we need to control for initial conditions, including the greater disruption of output in the former Soviet Union, while also checking for the presence of multiple equilibria. There is a strong positive relationship between the initial output fall in the “first reform year” (defined above) and total output in 1994. Our baseline regressions, reported in the tables, use the initial output fall as a control variable. As in section II, we also checked the results using a dummy for having belonged to the Soviet Union.

### *Official Output*

Table 6(a) shows a significant positive correlation between official output in 1994 and external liberalization, privatization, and the Wall Street Journal’s measure of taxation. External liberalization and privatization are linearly related to official output: a one point increase in these measures translates into a 6-11 percentage points change in the official economy (controlling for belonging to the former Soviet Union). Tax

burden also has a positive coefficient, meaning that a lower tax burden (a higher score in the CEER index) is associated with less output decline.

These measures of the taxation parameter,  $t$ , have significant correlations even when we control for the initial output fall. Also significant are our indices of crime and corruption, and regulation. The Heritage Foundation measure of regulation has the predicted negative sign, although it is significant only at the 10 percent level. Not surprisingly, a higher share of the unofficial economy (derived from our electricity calculations) is correlated with a lower level of officially measured GDP (taken directly from IMF statistics). The  $R^2$  in this regression is 0.81.

Part b of Table 6 shows equally strong results. There is a positive correlation between official output performance and our four measures of legal reform, and that this is robust to controlling for the initial fall in output. Without including any other variables, the  $R^2$  in these regressions is as high as 0.7 (for “legal safeguards”), and lies in the 0.64-0.77 range when we control for the initial fall in output.

As predicted by our model, all the significant results in part a and part b of Table 6 become weaker when we include a dummy for the former Soviet Union or for the Commonwealth of Independent States.<sup>19</sup> As in Section IV, there are two clusters of countries when we plot the dependent variable against the independent variable. Eastern Europe and the Baltics have relatively high public goods provision in the form of a good legal environment and, on average, better official output performance than CIS countries.

### *Total Output*

As predicted by our model, these measures of  $t$  and  $Q$  are less strongly correlated with total output than with official output. Table 7(a) shows that of the standard “taxation” measures, none are robustly significant. The “tax burden” and “crime and corruption” variables have the strongest result. Part b of Table 7 shows a strong positive correlation with output for our three best measures of legal environment: legal

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<sup>19</sup>The extensiveness of legal rules is significant at the 10 percent level with the FSU dummy but not the CIS dummy. The Heritage Foundation’s measure of regulation is significant at the 5 percent level just with the FSU dummy.

safeguards, rule of law, and legal effectiveness, but even this breaks down when we control for belonging to the former Soviet Union.

### *Entrepreneurs*

In our theoretical framework it is probably “entrepreneurs” who switch most readily between official and unofficial activities. In addition to the aggregate measures considered above, it therefore makes sense also to consider the available disaggregate measures of entrepreneurship (taken from EBRD 1995 and 1996). Appendix 3 discusses the available data and describes the most reasonable estimates of the size of the entrepreneurial sector.

We look first at new “start-up” private sector firms as a percent of both official and total GDP in 1995. Tables 8 and 9 show that the relative size of start-ups is higher where effective taxation,  $t$ , is lower and the quality of public goods,  $Q$ , in the official sector is better. Of the standard measures considered above, only privatization appears not to be correlated with the share of start-ups in total economic activity, which is not surprising.

### *Summary*

These results indicate that growth in the official economy is slowed by high taxation, severe regulations, and poor quality public goods. As we saw in section IV, higher tax rates are generally associated with lower government revenue, lower government spending, and inferior provision of public goods to the official sector.

## VI. Stabilization Reassessed

Aslund, Boone, and Johnson (1996) showed that all the transition countries stabilized eventually: countries that deregulated their economies (i.e., most of Eastern Europe) stabilized at the same time; and countries that did not deregulate (i.e., most of the former Soviet Union) also stabilized although with a lag. By the third year of reform, most former Soviet countries had inflation under control. Therefore, cross-sectional regressions cannot determine whether deregulation or stabilization has had a larger impact on growth particularly since our most recent data are from 1995 -- Table 10 shows results from using fiscal balance (a measure of the budget deficit) and log inflation as proxies for stabilization policy.

By early 1997, when reform in the former Soviet countries was entering its fifth year, inflation in Russia was below 20 percent per annum. By the end of 1997, inflation may be even lower in Russia than in the Baltics and Poland. Figures 11 and 12 show inflation in Poland compared with Russia and Ukraine respectively. Poland had smaller initial inflation and a more rapid disinflation, but by the fourth year of reform - - 1994 in Poland and 1996 in Russia -- the difference was not large.

These data suggest that stabilization and deregulation are actually quite different economic processes and, while their effects may be complementary, they do not necessarily occur together. The data also suggests an important divergence in performance for stabilized transition economies with and without deregulation.

First, the share of the unofficial economy has gone up rather than down in countries where there has been stabilization without deregulation. Figure 13 shows the unofficial economy rising and then falling with reform in Poland but continuing to rise in Russia. Figure 14 shows that while Polish total output (including the unofficial economy) fell for only two years after the beginning of reform in 1990, in Russia output has still to turn up.<sup>20</sup> These results strongly suggest that stabilization by itself does not reduce the share of the unofficial economy and does not lead to an output recovery.

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<sup>20</sup> In response to the concern that we might just be comparing economies at different stages of their reform process, we would note there is no evidence that the "early" reformers had such a large share of the unofficial economy ever; looking at 1994 probably understates this share relative to what it is in 1995 or 1996.

Second, panel data regressions (with fixed effects) indicate that stabilization may be less important in terms of its effect on output than deregulation. Table 11 shows the results of regressing total output (official plus unofficial GDP) on log inflation, internal liberalization, and privatization, controlling for the year relative to the start of reform. We use share of the unofficial economy as a proxy for both the extent of regulation and the quality of public goods, because we do not have a complete time series for any of the  $t$  or  $Q$  variables discussed above.

In the first column, the standard regression run for 1989-1994 without the share of the unofficial economy, log inflation is significant at the 10% level and privatization is insignificant. Internal liberalization is significant but actually has the wrong sign. When we include the share of the unofficial economy on the right-hand side, it has a significant negative coefficient and the other coefficients are not significant. The same basic pattern is repeated if we use the 1992-1994 period (the exception is that internal liberalization is again significant with the wrong sign). However, if we use the 1992-95 none of the variables is significant (with the exception of internal liberalization).

This result suggests that total output is higher when the share of the unofficial economy is lower. It also suggests, although it does not prove, that deregulation may be more important for output performance than stabilization. Given that inflation has tended to converge across countries but regulatory environment and the quality of public goods have diverged, it seems likely that stabilization and deregulation are governed by separate processes. Both may be necessary for an output recovery, but of the two only achieving stabilization appears possible for all transition economies.

## VII. Conclusions

This paper has developed a simple framework for understanding the relationship between taxation and the provision of public goods in an economy, and put forward a number of straightforward propositions about how tax and regulatory policies affect the relative size of unofficial activities and economic performance.

The economic transition after the collapse of communism offers an excellent opportunity to test this theory and the available evidence broadly supports the theory.

There are two types of economies among transition countries. First, there are those with relatively low effective tax burdens, relatively light regulation, high tax revenues, and relatively good provision of public goods in the official sector. Second, there are economies with relatively high effective tax burdens, relatively onerous regulation, low tax collection, and relatively poor public goods. Comparing these two types, the former has a lower share of unofficial activity and better growth performance than the latter.

These results confirm that entrepreneurship is central to transition, but indicate a somewhat different role than has previously been thought. New businesses have a real choice about whether to operate in the official or unofficial economy. If public goods in the official economy are high quality, entrepreneurs will register their activities, the government will receive tax revenue and continue to provide public goods. However, if official sector public goods are low quality, entrepreneurs will not register and the government will not get revenue. Reforming an official sector to make it more favorable to new private businesses is an essential part of reform which, the evidence suggests, has too often been neglected.



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## Appendix 1

### Central European Economic Review's Panel of Experts

The Wall Street Journal's Central European Economic Review (CEER) altered panel composition and asked somewhat different questions in each year. In the February 1995 version, which appears to have been their first attempt at these ratings, CEER explains "We asked the panelists to rate each of the 25 countries on 10 categories reflecting their capacity for development through the year 2000. Grades were given on a scale of 0 to 10, with 10 the highest possible mark, on the basis of the analysts' judgment of the countries' state five years from now. An average of the results is presented, along with a cumulative average for each country ..." The panel comprised Dirk W. Damrau (Salomon Brothers, London), Susanne Gahler (JP Morgan & Co., London), Andreas Gummich (Deutsche Bank, Frankfurt), Jonathan Hoffman (CS First Boston, London), James Lister-Cheese (Independent Strategy, London), Philip Poole (ING Bank, London), Jan Vanous (with Keith Crane and Don Green from PlanEcon, Washington), and Werner Varga (Creditanstalt-Bankverein, Vienna). The 10 categories were: economic growth, price stability, political stability, currency stability, privatization, infrastructure, productivity, legal framework, trade prospects, and natural resources. Because the panel was looking forward 5 years these measures seem less reliable as indicators of how they viewed the past and current situation and we do not use any in this paper.

In the December 1995-January 1996 issue, CEER reports "We asked our panel to rank (sic) each of the 26 countries on the basis of their attractiveness as a place to do business over the coming year. Grades were given on a scale of 0 to 10, with 0 the lowest and 10 the highest score." In this instance the panel had two changes, with Peter Havlik (Vienna Institute for Comparative Economic Studies), Donald Green (PlanEcon) replacing Philip Poole and Jan Vanous. The 10 categories this time were economic growth, price stability, currency stability, legal safeguards, productivity, infrastructure, ease of portfolio investment, banking system, corruption and crime, and tax burden. Particularly because these questions were more precise, we use three measures from this year: legal safeguards, corruption and crime, and tax burden.

In the December 1996-January 1997 panel assessment, CEER's general request to the panel appears to have been the same as in the previous year: "We asked our panel to rank (sic) each of the region's countries on the basis of their attractiveness as a place to do business over the coming year..." Each panel member provided ratings on each dimension and the average is reported by CEER, together with an overall ranking. On this occasion the panel did not include Dirk Damrau and Donald Green, and replaced them with Dan Ljubash (Merrill Lynch) and Miranda Xafa (Salomon Brothers International). Five of the original 1995 panel remain: Gahler, Gummich, Hoffman, Lister-Cheese, and Varga. The number of categories is now only seven: economic growth, price stability, integration into world economy, currency stability, rule of law, ease of portfolio investment, and productivity. Of these, we use only "rule of law" because it may contain some information not revealed in previous panel assessments.

## Appendix 2

### Comparison of Legal Environment Evaluations

Given that we are particularly interested in the legal environment of reforming countries, how do alternative available measures compare in their rating of countries? An interesting comparison is possible for the former Soviet Union, particularly because we can use an IMF measure of institutional development in these countries at the end of 1994. This can serve as a useful cross-check of the indices we use in our regressions.

The IMF ranks countries as having low, medium, or substantial progress in terms of fiscal consolidation, privatization/land restitution, government/institutional reform, legal framework, social safety net, and trade liberalization. Intermediate ratings are also allowed, e.g., moderate/substantial, so their ratings are essentially a 5 point scale, similar to that of the EBRD. The Table below compares the IMF legal environment measures with the two available EBRD measures and the three CEER measures.

The EBRD measures are well documented and easy to understand, although there are a few exceptions. Most notably the EBRD increased Ukraine's "legal effectiveness" rating from 2 in 1995 to 4 in 1996 (see Appendix 1 below), which is surprising and not easy to confirm from their qualitative assessment.

	IMF 1994 "legal framework"	EBRD 1995 "legal effect- iveness"	EBRD 1996 "legal effect- iveness"	CEER 1995 "legal framework"	CEER 1996 "legal safeguards"	CEER 1997 "rule of law"
Estonia	4	4	5	4.2	3.7	3.9
Latvia	4	2	3	4	3.5	3.75
Lithuania	4	2	2	3.8	3.3	3.35
Kyrgyz Republic	3	2	2	1.95	1.5	1.5
Russia	2	1	2	2.7	2	2
Kazakhstan	3	1	2	4.4	1.55	1.85
Moldova	1	2	3	2.5	2.15	2.25
Armenia	1	2	3	2.15	1.45	1.15
Azerbaijan	1	1	2	1.75	1.3	1.15
Belarus	1	1	2	2.35	1.8	1.1
Georgia	1	1	2	1.45	1.15	1.5
Tajikistan	1	1	2	1.3	0.75	1.25
Turkmen- istan	1	1	1	1.25	1.25	0.75
Ukraine	1	2	4	2.4	1.9	1.5
Uzbekistan	1	1	2	1.75	1.3	1.85

Notes. Countries are listed in same order as given by Citrin (1995). CEER ratings have been divided by 2 to make comparison easier. In the EBRD ratings, 4\* has been converted to 5.

The IMF clearly differs from the EBRD and CEER in the particular ratings assigned. In part this may be due to the different timing of evaluations, but it may also reflect unspecified differences in criteria. Despite considerable variation in absolute values, the series are quite consistent in terms of the relative ranking of countries.

## Appendix 3

### Measures of Start-Up Entrepreneurs

The EBRD (1995, Table 1 on p.28, Table 3 on p.30, and Annex 9.1 on pp.147-152) provides the best available of both "purely" privately owned enterprises and the "non-state sector" as a share of GDP in post-communist countries. However, we need to make three important corrections to these numbers.

First, to estimate of the size of the genuine "start-up" entrepreneurial private sector at the beginning of reform, we need to subtract "cooperative" firms from the EBRD numbers. These firms were classified as private firms in official statistics, but in fact were usually just a disguised form of state enterprise. In both Poland and the Czech Republic the EBRD number is for the "non-state sector," which includes cooperatives, and our estimate is consequently significantly lower.<sup>21</sup>

EBRD (1995, Table 3, p.30) gives estimates on the "non-state sector" for Armenia, Georgia, and Uzbekistan and on the "pure private sector" for Belarus, Estonia, Kazakhstan, Lithuania, Russian, and Ukraine. However, our adjustments for the former Soviet Union are smaller than for Eastern Europe because much of the non-state sector in 1989 actually comprised start-up businesses which were disguised for tax and legal purposes (Johnson and Kroll 1991).

Second, data is missing for a number of countries, and in these cases we assume the private sector share was the same as in similar countries for which we have estimates. For example, the initial private sector share in Albania is assumed equal to that in the Czech Republic because both had highly quite repressed economies. Similarly, in cases where the EBRD does not give numbers for 1989 or 1994/95, we make an adjustment based on what happened in similar countries. For example, the EBRD Bulgarian estimate is only for 1991 and we assume change since 1989 was similar to that in Romania and Slovenia.

Third, the EBRD does not distinguish between privatized firms and start-ups. For example, part of the increase in private sector share of GDP in Romania is due to the privatization and corporatization of agricultural cooperatives in 1991. For the "final" 1995 estimate (given in the last column of the table below) we adjust for the amount of privatization. Small-scale privatization in these countries typically transfers 5-10 percent of GDP to the private sector. Based on the Czech experience, a mass program of large-scale privatization transfers up to 30 percent of GDP to the private sector.<sup>22</sup> We make a similar adjustment in estimates of the share of private sector start-ups in GDP for other countries.<sup>23</sup>

Russia poses a particular problem in this regard. On p.30 of EBRD (1995) Russian privatization is apparently classified by the EBRD as contributing to the growth of the "non-state sector" while Czech privatization increases the reported private sector share of GDP (p.28). However, the EBRD is not consistent. In Table 3, p.30 EBRD (1995) puts the "pure private sector" in Russia at 25.0 percent of GDP, while on p.11 the estimate for "private sector share of GDP in percent, mid-95" is 55 percent. Given that Russian privatization was at least as extensive as in the Czech Republic, we deduct the full 35 percent "privatization correction" from the larger EBRD estimate.

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<sup>21</sup> For a more detailed discussion of the probable size of the private sector in these countries, see Johnson and Loveman (1995), particularly Chapter 8.

<sup>22</sup> EBRD (Table 1, p.28) shows an increase of private sector share in GDP from 17.3 in 1991 to 45.1 percent in 1993 and 56.3 percent in 1994, most of which is probably due to large-scale privatization.

<sup>23</sup> In the period 1989-1995 there was not much privatization in Croatia, Slovenia, Romania, Bulgaria. There was some piecemeal privatization in Poland. Privatization in Hungary and the Slovak Republic was significant but not as large as in the Czech Republic.

country	EBRD "Private Sector in GDP" before reform (% of GDP)	Revised Estimate of Initial Private Sector (% of Official GDP)	EBRD "Private Sector in 1994/95" (% of GDP)	Revised Estimate of "Final" Private Sector (% of Official GDP)
<b>Eastern Europe</b>				
Albania	n.a.	5	n.a./60	50
Bulgaria	16.6 (1991)	10	40.2/45	40
Croatia	18.8 (1990)	20	44.9/45	45
Czech Republic	11.2 (1989)*	5	56.3/70	30
Hungary	14.9 (1989)	15	n.a./60	45
Macedonia	n.a.	20	n.a./40	40
Poland	28.6 (1989)*	15	56.0/60	50
Romania	12.8 (1989)	10	35.0/40	35
Slovak Rep.	n.a.	5	43.8/60	25
Slovenia	8.1 (1989)	10	n.a./45	45
<b>Former Soviet Union</b>				
Armenia	8.1 (1989)*	10	n.a./45	35
Azerbaijan	n.a.	10	n.a./25	25
Belarus	5.1 (1989)	5	n.a./15	10
Estonia	17.7 (1991)*	10	n.a./65	50
Georgia	17.6 (1989)*	10	n.a./30	25
Kazakhstan	15.0 (1989)	10	20.2/25	20
Kyrgyzstan	n.a.	10	n.a./40	35
Latvia	n.a.	10	n.a./60	50
Lithuania	10.4 (1989)	10	n.a./55	40
Moldova	n.a.	10	n.a./30	20
Russia	5.3 (1989)	5	25.0/55	20
Tajikistan	n.a.	5	n.a./15	15
Turkmenistan	n.a.	5	n.a./15	15
Ukraine	7.6 (1990)	5	7.5(1993)/35	30
Uzbekistan	n.a.	5	n.a./30	30

Sources: The first column on Eastern Europe is from EBRD (1995, Table 1, p.28).

In third column, the first number is for 1994 from EBRD (1995, Table 1, p.28) and the second is for mid-1995 from EBRD (1995, Table 2.1, p.11).

\* denotes that the estimate is for a broader definition of the non-state sector, rather than just the private sector.

## Appendix 4

### General Government Spending

The best series on government spending as a percent of official GDP is from EBRD (1996). These are reported in the first two columns of the following table. Unfortunately, EBRD does not give any numbers on spending in Russia, but Cheasty and Davis (1996) provide an estimate which should be comparable. The Cheasty and Davis series is similar for almost all the former Soviet countries on which the EBRD (1996) also gives data; generally these series are within 1-2 percentage points.

The third and fourth columns give government spending as a percent of total GDP. These estimates are obtained by multiplying the EBRD estimate and our estimate of the share of official GDP in total GDP. For the reasons given in section III above, these estimates are probably more reliable for 1994 than 1995.

### General Government spending (% of GDP), 1994 and 1995

	1994	1995	1994	1995	definition used
	% of official GDP	% of official GDP	% of total GDP	% of total GDP	
<b>Central East Europe</b>					
Albania	41	36	n.a.	n.a.	general government (commitment basis)
Bulgaria	46.0	41.7	32.6	26.6	general government (cash basis)
Croatia	41.6	48.5	n.a.	n.a.	central government
Czech Republic	50.0	n.a.	41.2	n.a.	general government
Hungary	62.1	56.1	44.9	39.8	general government
Macedonia	33	29	n.a.	n.a.	central government
Poland	47.5	n.a.	40.3	n.a.	general government (commitment, except external interest)
Romania	32.4	36.3	26.7	n.a.	general government (cash basis)
Slovak Republic	47.7	48.3	40.7	45.5	general government
Slovenia	47.3	46.2	n.a.	n.a.	general government



	1994	1995	1994	1995	definition used
	% of official GDP	% of official GDP	% of total GDP	% of total GDP	
<b>Former USSR</b>					
Russia	43.7	31.9	26.1	18.6	general government
Armenia	43.7	27	n.a.	n.a.	consolidated central government (accrual basis)
Azerbaijan	46.5	30.0	19.5	11.8	general government
Belarus	51	45.1	41.4	36.4	general government
Estonia	39.9	41.5	29.9	36.6	general government
Georgia	24	13.0	8.7	4.9	consolidated government (cash basis)
Kazakhstan	24	18.8	15.8	12.3	total expenditure
Kyrgyzstan	28.6	28.1	n.a.	n.a.	government expenditure and net lending
Latvia	38.2	38.2	25.1	25.5	general government
Lithuania	29.3	27.9	20.9	21.9	general government and net lending
Moldova	32.1	29.4	19.3	18.9	general government and net lending (GFS concept)
Tajikistan	55	30.6	n.a.	n.a.	general government
Turkmenistan	10.4	10	n.a.	n.a.	central government
Ukraine	53.5	45.0	29.1	23.0	general government plus direct credits
Uzbekistan	38.4	39.2	48.4	42.1	general government

Source: All numbers are from EBRD (1996), pp.185-209, except Russia which is from Cheasty and Davis (1996).

"General Government" usually includes central state, local governments, and extra-budgetary funds. However, the EBRD is not always explicit about what is included in the particular definition used for each country. Cheasty and Davis probably have extra-budgetary funds in their estimates.

Appendix 5

Measures of Reform

Variable	Description	Source
<b>Measures of Parameter t</b>		
1. Internal Liberalization	Liberalization of "internal markets": price liberalization and abolition of state trading monopolies Scale of 0 to 1 where a higher score means more liberalized.	Denizer, de Melo, and Gelb (1996, Section III); updated from unpublished database obtained through IMF (Sabay 1996)
2. External Liberalization	Extent of liberalization in "Trade and Foreign Exchange System." Equals 1 if "widespread import and/or export controls or very limited legitimate access to foreign exchange"; 2 if "some liberalization of import and/or export controls; almost full current account convertibility in principle but with a foreign exchange regime that is not fully transparent (possibly with multiple exchange rates)"; 3 if "removal of most quantitative and administrative import and export restrictions; almost full current account convertibility at a unified exchange rate"; 4 if "removal of all quantitative and administrative import and export restrictions (apart from agriculture) and all significant export tariffs; insignificant direct involvement in exports and imports by ministries and state-owned trading companies; no major non-uniformity of customs duties for non-agricultural goods and services"; 5 if "standards and performance norms of advanced industrial countries; removal of most tariff barriers; membership in GATT/WTO."	EBRD 1995, Table 2.1, p.11; updated in EBRD 1996, Table 2.1, p.11.)
3. Large-Scale Privatization	Extent to which large state-owned firms have been privatized. Equals 1 if "little progress"; 2 if "comprehensive scheme almost ready for implementation; some sales completed"; 3 if "more than 25 percent of large-scale state-owned enterprise assets privatized or in the process of being sold, but possibly with major unresolved issues regarding corporate governance"; 4 if "more than 50 percent of state-owned enterprise assets privatized in a scheme that has generated substantial outsider ownership"; 5 if "standards and performance typical of advanced industrial economies; more than 75 percent of enterprise assets in private ownership with effective corporate governance."	EBRD 1995, Table 2.1, p.11; updated in EBRD 1996, Table 2.1, p.11.)
4. Tax Burden	Scale of 0 to 10, with a higher score meaning lower effective taxes.	Wall Street Journal's Central European Economic Review, December 1995-January 1996. For more detail see Appendix 1.
5. Crime and Corruption	Scale of 0 to 10, with a higher score meaning lower effective taxes.	Wall Street Journal's Central European Economic Review, December 1995-January 1996. For more detail see Appendix 1.
6. Regulation	The scoring for regulation is: "very low," corruption-free, existing regulations are straightforward and applied uniformly to all businesses, regulations are not much of a burden to business, score 1; "low," simple licensing procedure, no bribes, existing regulations are relatively straightforward and applied uniformly most of the time, regulations prove to be a burden to business in some instances, score 2; "moderate," existing regulations may be applied haphazardly and in some instances are not even published by the government, complicated licensing procedure, regulations are a substantial burden to business, a significant state-owned sector exists, no bribes, score 3; "high," government-set production quotas and state planning, major barriers to opening a business, complicated licensing process, very high fees, bribes sometimes necessary, regulations a great burden to business, score 4; "very high," government discourages new business creation, bribes mandatory, regulations applied randomly, score 5.	Heritage Foundation, published in Johnson and Sheehy 1996. Grading is described on their pp.28-29.
7. Unofficial Economy	Percent of unofficial activity in total GDP. Potential range is from 0 to 100.	Kaufmann and Kaliberda (1996).

<b>Measures of Variable Q</b>		
1. Legal Safeguards	Scale of 0 to 10, with a higher score meaning lower effective taxes.	Wall Street Journal's Central European Economic Review, December 1995-January 1996. For more detail see Appendix 1.
2. Rule of Law	Scale of 0 to 10, with a higher score meaning lower effective taxes.	Wall Street Journal's Central European Economic Review, December 1996-January 1997. For more detail see Appendix 1.
3. Legal Effectiveness	“The effectiveness of legal rules on investment” on a scale of 1 to 5. Equals 1 if “Legal rules are usually very unclear and often contradictory and the availability of independent legal advice is very limited. The administration of the law is substantially deficient (e.g. little confidence in the abilities and independence of the courts, no or poorly organized security and land registers)”. Equals 2 if “Legal rules are usually unclear and sometimes contradictory. Legal advice is often difficult to obtain. The administration and judicial support of the law is rudimentary.” Equals 3 if “While legal rules are reasonably clear and ascertainable through legal advice, administrative or judicial support is often inadequate (e.g. substantial discretion in the administration of laws, few up-to-date registers). Equals 4 if “The law is usually clear and legal advice is readily available. Investment laws are reasonably well administered and supported judicially, although that support is sometimes patchy.” Equals 5 if “The law is clear and readily ascertainable. Sophisticated legal advice is readily available. Investment law is well supported administratively and judicially, particularly regarding the efficient functioning of courts and the orderly and timely registration of proprietary or security interests.”	EBRD 1995, Table 2.1, p.11; updated in EBRD 1996, Table 2.1, p.11.)
4. Legal Extensiveness	“The extensiveness of legal rules on investment” on a scale of 1 to 5. Equals 1 if “Legal rules are very limited in scope, and impose substantial constraints on creating investment vehicles, security over assets or to the repatriation of profits. Indirect investment is not specifically regulated.” Equals 2 if “Legal rules are limited in scope, and impose significant constraints on creating investment vehicles, adequate security over assets, or the repatriation of profits.” Equals 3 if “Legal rules do not impose major obstacles to creating investment vehicles and security or to repatriating profits. However, they are in need of considerable improvements.” Equals 4 if “Legal rules do not discriminate between foreign and domestic investors and impose few constraints on creating a range of investment vehicles and security instruments. Indirect investment is specifically regulated.” Equals 5 if “Legal rules closely approximate generally accepted standards internationally and impose few restrictions, including on the creation of sophisticated investment vehicles or security. Indirect investment law is well developed.”	EBRD 1995, Table 2.1, p.11; updated in EBRD 1996, Table 2.1, p.11.)
<b>Measures of Stabilization Policy</b>		
1. Fiscal Balance	Budget deficit as a percent of official GDP, calculated using IMF definitions.	IMF database, from Sahay (1996). An earlier version of this data is used in Fischer, Sahay, and Vegh (1996a and 1996b).
2. Inflation	Annual change in CPI (average-to-average).	IMF database, from Sahay (1996). An earlier version of this data is used in Fischer, Sahay, and Vegh (1996a and 1996b).

**Notes:**

For the EBRD indices there is no apparent reason for using 4\* rather than 5. As the EBRD says, “Most advanced economies would qualify for the 4\* rating for almost all transition indicators” (1997, p.11, footnote 1). In all our work we have converted 4\* into 5.

Countries	Share of the Unofficial Economy (percent of total GDP)							Official GDP in 1994 (1989=100)	Total GDP in 1994 (1989=100)
	1989	1990	1991	1992	1993	1994	1995		
Eastern Europe									
Bulgaria	22.8	25.1	23.9	25.0	29.9	29.1	36.2	72.3	78.7
Czech Republic	6.0	6.7	12.9	16.9	16.9	17.6	11.3	81.0	92.4
Hungary	27.0	28.0	32.9	30.6	28.5	27.7	29.0	83.4	84.3
Poland	15.7	196.0	23.5	19.7	18.5	15.2	12.6	92.0	91.4
Romania	22.3	13.7	15.7	18.0	16.4	17.4	19.1	72.7	68.4
Slovakia	6.0	7.7	15.1	17.6	16.2	14.6	5.8	77.9	85.8
Former Soviet Union									
Azerbaijan	12.0	21.9	22.7	39.2	51.2	58.0	60.6	30.1	71.5
Belarus	12.0	15.4	16.6	13.2	11.0	18.9	19.3	62.5	67.8
Estonia	12.0	19.9	26.2	25.4	24.1	25.1	11.8	67.1	78.8
Georgia	12.0	24.9	36.0	52.3	61.0	63.5	62.6	15.6	37.6
Kazakhstan	12.0	17.0	19.7	24.9	27.2	34.1	34.3	51.0	68.2
Latvia	12.0	12.8	19.0	34.3	31.0	34.2	35.3	48.1	64.3
Lithuania	12.0	11.3	21.8	39.2	31.7	28.7	21.6	43.9	54.1
Moldova	12.0	18.1	27.1	37.3	34.0	39.7	35.7	41.7	60.9
Russia	12.0	14.7	23.5	32.8	36.7	40.3	41.6	51.3	75.5
Ukraine	12.0	16.3	25.6	33.6	38.0	45.7	48.9	44.2	71.6
Uzbekistan	12.0	11.4	7.8	11.7	10.1	9.5	6.5	85.0	82.6

Table 2(a)  
Share Regressions: Liberalization, Privatization, Taxation, Corruption, and Regulation

RHS variable	LHS: 1994 share of unofficial economy in total GNP (share)																	
	cons. only	cons& FSU	cons& init.sh.	cons. only	cons& FSU	cons& init.sh.	cons. only	cons& FSU	cons& init.sh.	cons. only	cons& FSU	cons& init.sh.						
Initial Share (DK: inshare)			-0.1 [0.55]		0.3 [0.26]				-0.4 [0.57]		-0.1 [0.38]		0.09 [0.44]		0.5 [0.68]			
FSU dummy (fsu)		14.7* [6.1]			-0.6 [4.8]						8.1 [5.3]			9.6 [6.0]	18.9* [4.8]			
LIBERALIZATION 1. Internal Liberalization (Gelb: fsviii)		-59.8* [18.9]	-36.1* [18.9]	-59.5* [19.8]														
2. External Liberalization (EBRD: ttextor)				-13.0* [1.4]	-13.3* [2.3]	-13.4* [1.4]												
PRIVATIZATION 3. Large-scale Privatization (EBRD: largp)							-6.7* [2.5]	-4.8* [2.0]	-6.9* [2.5]									
TAXATION 4. Tax Burden (CEER: ceer96tb)										-9.5* [1.6]	-7.6* [2.0]	-9.5* [1.7]						
CORRUPTION 5. Crime and Corruption (CEER: ceer96cc)													-4.7* [1.0]	-3.4* [1.2]	-4.7* [1.0]			
REGULATION 6. Regulation (HF: ashfreg)															9.2* [3.7]	7.2 [2.6]	11.2* [3.8]	
Number of Observations	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	14	14	
R-Squared	0.43	0.62	0.44	0.87	0.87	0.88	0.36	0.67	0.39	0.73	0.77	0.73	0.64	0.71	0.65	0.33	0.72	0.45

Standard errors are in brackets  
\* Significant at 5% level  
\*\* Significant 10% level

Table 2(b)  
Share Regressions: Legal Environment

RHS variable	LHS: 1994 share of unofficial economy/ln total GNP (share)					
	cons. only	cons. & FSU	cons. & ln.sh.	cons. only	cons. & FSU	cons. & ln.sh.
Initial Share (DK: lnshare)		0.1 [0.4]		-0.2 [0.5]		-0.2 [0.5]
FSU dummy (fsu)		9.1 [6.0]		13.1* [5.0]		12.7** [6.3]
<b>LEGAL ENVIRONMENT</b>						
1. legal safeguards (CEER: ceer96is)		-5.1* [1.0]		-3.8* [1.3]		-5.1* [1.1]
2. rule of law (CEER: ceer97)				-4.8* [1.2]		-3.4* [1.1]
3. Legal Effectiveness (EBRD: effector)						-4.8* [1.2]
4. Legal Extensiveness (EBRD: extenfor)						-10.4* [2.8]
						-6.6** [3.1]
						-10.3* [2.9]
						-10.2* [4.0]
						-2.3 [5.1]
						-10.8* [4.4]
Number of Observations	15	15	15	15	15	15
R-Squared	0.66	0.72	0.66	0.57	0.73	0.58
				0.52	0.64	0.53
				0.33	0.52	0.34

**Table 3**  
**Taxation and the Provision of Public Goods (1994 data)**

	(gtxtot) Government Tax Revenue % of total GDP constant only	(gexptot) Government Spending % of total GDP constant only	"legal safeguards" from CEER panel (ceer96ls) constant only	"rule of law" from CEER panel (ceer97) constant only	"crime and corruption" from CEER panel (ceer96cc) constant only
control variable (FSU dummy)	-11.2* [4.7]	-12.4* [4.5]	-0.5 [0.7]	0.5 [0.7]	-0.3 [0.7]
TAXATION					
tax burden (CEER: ceer96tb)	6.5* [1.6]	5.3* [1.6]	1.6* [0.2]	1.6* [0.2]	1.6* [0.2]
	3.8** [1.8]	2.2 [1.7]	1.5* [0.3]	1.7* [0.3]	1.6* [0.3]
Number of Observations	15	15	23	23	23
R-Squared	0.57	0.71	0.80	0.81	0.79

Standard errors are in brackets  
 \* Significant at 5% level  
 \*\* Significant at 10% level

Table 4  
Government Spending as Dependent Variable

	LHS: Government Spending as percent of total GDP 1994 (exptot)															
	cons. only		cons. & fsu		cons. only		cons. & fsu		cons. only		cons. & fsu		cons. only		cons. & fsu	
FSU dummy																
CEER Measures																
1. legal safeguards (CEER: ceer96is)			3.7*	2.6*												
2. crime and corruption (CEER: ceer96cc)			[0.7]	[0.8]												
3. tax burden (CEER: ceer96tb)					3.2*	2.0*										
4. rule of law (CEER: ceer97)							5.3*	2.2								
							[1.6]	[1.7]								
STANDARD Measures																
1. Inflation (logfsvia)																
2. Internal liberalization (fsviii)																
3. Privatization (largp)																
No. of obs	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
R-Squared	0.71	0.80	0.62	0.75	0.45	0.66	0.50	0.76	0.73	0.83	0.33	0.65	0.41	0.80		



Table 5  
Government Spending as Independent Variable

RHS variable	LHS: 1994 share of unofficial economy						LHS: 1994 total output						LHS: 1994 Official Output						
	in total GNP (share)		cons. & fsu		cons. & in.sh.		cons. & fsu		cons. & in.sh.		cons. & fsu		cons. & in.sh.		cons. & fsu		cons. & in.sh.		
Initial Share (DK: Inshare)																			
FSU dummy (fsu)			9.9	[8.7]					22.5*	[6.8]									
Initial Output fall total output (falltot)																			
official output (falloff)																			
GOV. SPENDING																			
1. as % total GDP (EBRD:gecptot)			-1.1*	[0.3]	-0.7	[0.4]													
2. as % official GDP (EBRD:gecp)					-1.1*	[0.3]													
					-0.4	[0.4]													
					0.2	[0.3]													
					-0.3	[0.38]													
1. as % total GDP (EBRD:gecptot)					1.2*	[0.18]													
2. as % official GDP (EBRD:gecp)					1.4*	[0.3]													
					0.93*	[0.22]													
					1.0*	[0.24]													
					0.75*	[0.25]													
					0.55**	[0.27]													
1. as % total GDP (EBRD:gecptot)					1.9*	[0.24]													
2. as % official GDP (EBRD:gecp)					1.3*	[0.4]													
					1.6*	[0.3]													
					1.1*	[0.44]													
					0.4	[0.33]													
					0.8	[0.41]													
Number of Observations	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
R-Squared	0.55	0.59	0.55	0.07	0.52	0.07	0.79	0.80	0.84	0.57	0.68	0.72	0.82	0.87	0.85	0.32	0.75	0.53	

Standard errors are in brackets  
\* Significant at 5% level  
\*\* Significant 10% level

Table 6(a)

Official Output Regressions: Liberalization, Privatization, Taxation, Corruption, Regulation, and Share of Unofficial Economy

RHS variable	LHS: Official Output in 1994 (offlevle)																				
	cons. only	cons. & fsu	cons. & falloff	cons. only	cons. & fsu	cons. & falloff	cons. only	cons. & fsu	cons. & falloff	cons. only	cons. & fsu	cons. & falloff									
Initial Fall in Official Output: 1st rel. year (falloff)			90.5* [35.2]			39.7 [28.5]			91.2* [36.8]			73.0* [29.8]			56.7 [31.9]			108.0* [36.5]			20.1 [29.2]
FSU dummy (fsu)		-30.7* [7.1]			-18.0* [7.8]				-31.3* [5.3]			-25.5* [7.2]			-23.7* [6.6]			-33.9* [5.7]			-17.7* [5.7]
LIBERALIZATION																					
1. internal liberalize (Gelb: fsvll)	79.6* [29.0]	30.2 [22.0]	60.5* [25.3]																		
2. external liberalize (EBRD: tector)				17.7* [2.7]	11.0* [3.7]	15.3* [3.2]															
PRIVATIZATION																					
3. privatization (EBRD: largp)							9.4* [3.7]	5.8* [2.0]	6.9* [3.3]												
TAXATION																					
4. tax burden (CEER: ceer96lb)							12.4* [2.9]	6.1* [2.7]	10.0* [2.6]												
CORRUPTION																					
6. crime and corruption (CEER: ceer96cc)															6.8* [1.4]	3.7* [1.3]	5.5* [1.5]				
REGULATION																					
7. Regulation (HF: ashfreg)																		-10.8** [5.8]	-7.2* [3.0]	-8.9** [4.5]	
UNOFFICIAL ECON.																					
8. Share (DK: share)																					
Number of Observations	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	14	14	15
R-Squared	0.37	0.75	0.59	0.76	0.84	0.80	0.33	0.83	0.56	0.59	0.8	0.73	0.65	0.83	0.72	0.22	0.82	0.57	0.81	0.89	0.81

Standard errors are in brackets  
 \* Significant at 5% level  
 \*\* Significant 10% level

Table 6(b)  
Official Output Regressions: Legal Environment

RHS variable	LHS: Official Output in 1994 (offlevel)										
	constant only	constant & FSU	constant & in fall	constant only	constant & FSU	constant & in fall	constant only	constant & FSU	constant & in fall		
Initial Fail in Official Output: 1st ref year (failoff)			55.6** [28.7]			75.3* [34.4]			77.3* [28.6]		70.4* [31.5]
FSU dummy (fsu)		-22.1* [6.2]			-27.8* [5.7]				-25.7* [6.6]		-26.1* [8.4]
LEGAL REFORM											
1. legal safeguards (CEER: ceer96is)	7.6* [1.4]	4.5* [1.3]	6.3* [1.4]								
2. rule of law (CEER: ceer97)				6.5* [1.8]	3.6* [1.2]	5.0* [1.7]					
3. Legal Effectiveness (EBRD: effeor)							15.8* [3.7]	8.2* [3.2]	12.9* [3.3]		
4. Legal Extensiveness (EBRD: extenfor)							17.5* [5.1]	8.3 [5.1]	15.5* [4.4]		
Number of Observations	15	15	15	15	15	15	15	15	15	15	15
R-Squared	0.70	0.83	0.77	0.50	0.83	0.64	0.58	0.82	0.74	0.58	0.77

Table 7(a)

Total Output Regressions: Liberalization, Privatization, Taxation, Corruption, Regulation, and the Unofficial Economy

RHS variable	LHS: Total output in 1994 (total)																						
	cons. only	cons. & FSU	cons. & init fall	cons. only	cons. & FSU	cons. & init fall	cons. only	cons. & FSU	cons. & init fall	cons. only	cons. & FSU	cons. & init fall											
Initial Fall in Total Output: 1st reform year (falltot)			176.1* [27.3]			140.8* [36.7]			153.4* [39.1]			159.0* [29.9]			145.7* [31.0]			174.6* [36.4]			131.8 [36.0]		
FSU dummy (fsu)		-17.2* [7.2]			-12.6 [9.5]			-15.9* [5.9]			-15.6 [8.0]			-12.7 [7.7]				-17.4* [6.2]			-9.9 [8.1]		
LIBERALIZATION																							
1. internal liberalize (Gelb: fsyiii)	37.0 [22.4]	9.3 [22.5]	39.3 [11.1]																				
2. external liberalize (EBRD: tekfor)				8.5* [3.0]	3.8 [4.6]	4.8** [2.3]																	
PRIVATIZATION																							
3. privatization (EBRD: largp)							5.5* [2.7]	3.7 [2.3]	2.7 [2.0]														
TAXATION																							
4. tax burden (CEER: ceer96tb)							5.7* [2.6]	1.9 [3.1]	4.5* [1.5]														
CORRUPTION																							
5. crime and corruption (CEER: ceer96cc)															3.5* [1.2]	1.9 [1.5]	2.4* [0.8]						
REGULATION																							
6. Regulation (HF: ashfreg)																							
UNOFFICIAL ECONOMY																							
7. share (DK: share)																							
Number of Observations	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	14	14	15	15	
R-Squared	0.17	0.44	0.82	0.38	0.46	0.72	0.25	0.53	0.67	0.27	0.45	0.78	0.38	0.5	0.78	0.19	0.53	0.74			0.46	0.52	0.75

Standard errors are in brackets

\* Significant at 5% level

\*\* Significant 10% level

Table 7(b)  
Total Output Regressions: Legal Environment

RHS variable	LHS: Total output in 1994 (total)														
	constant only	cons. & fsu	cons. & Initial Fail	constant only	cons. & fsu	cons. & Initial Fail	constant only	cons. & fsu	cons. & Initial Fail	constant only	cons. & fsu	cons. & Initial Fail			
Initial Fail in Total Output: 1st reform year (fall0r)			137.6* [31.8]			153.5* [34.5]					140.3* [28.6]				145.3* [51.2]
FSU dummy (fsu)		-11.0 [7.5]			-15.1* [6.8]						-11.3 [6.9]				-12.1 [8.4]
<b>LEGAL REFORM</b>															
1. legal safeguards (CEER: ceer96is)	4.1* [1.3]	2.6 [1.6]	2.8* [0.9]												
2. rule of law (CEER: ceer97)				3.2* [1.5]	1.7 [1.5]	2.1* [1.0]									
3. Legal Effectiveness (EBRD: effecor)							9.4* [2.9]	6.1** [3.4]	6.6* [1.8]						
4. Legal Extensiveness (EBRD: extenfor)										11.0* [3.8]	5.8 [5.1]	3.3 [4.1]			
Number of Observations	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
R-Squared	0.44	0.53	0.78	0.27	0.48	0.73	0.45	0.55	0.82	0.40	0.48	0.64			
Standard errors are in brackets															
* Significant at 5% level															
** Significant at 10% level															

**Table 8**  
**New Business Start-Ups as a Percent of Official GDP**

RHS variable	LHS: Start-ups as percent of official GDP						
	constant & initial start-ups	constant & initial start-ups	(stup) constant & initial start-ups	constant & initial start-ups	constant & initial start-ups	constant & initial start-ups	constant & initial start-ups
initial start-ups (instup)	0.4 [0.33]	0.3 [0.32]	0.5 [0.30]	0.4 [0.3]	0.4 [0.3]	0.3 [0.3]	0.7* [0.4]
CEEER Measures 1. legal safeguards (CEEER: ceer96ls) 2. crime and corruption (CEEER: ceer96cc) 3. tax burden (CEEER: ceer96tb) 4. rule of law (CEEER: ceer97)	2.9* [0.85]	2.9* [0.84]	5.2* [1.5]	2.8* [0.85]			
STANDARD Measursures 1. Inflation (logfsvia) 2. Internal liberalization (fsvlii) 3. Privatization (largp)					-4.0* [1.4]	69.0* [21.1]	3.5 [2.6]
No. of obs	23	23	23	23	24	24	23
R-Squared	0.50	0.50	0.52	0.49	0.42	0.48	0.28

**Table 9**  
**New Business Start-Ups as a Percent of Total GDP**

RHS variable	LHS: Start-ups in 1995 as percent of total GDP (startot)						
	constant & initial start-ups	constant & initial start-ups	constant & initial start-ups	constant & initial start-ups	constant & initial start-ups	constant & initial start-ups	constant & initial start-ups
initial start-ups (lnstart)	0.4 [0.55]	0.2 [0.54]	0.7 [0.6]	0.2 [0.6]	1.0 [0.7]	0.4 [0.7]	0.7 [0.9]
CEER Measures 1. legal safeguards (CEER: ceer96is) 2. crime and corruption (CEER: ceer96cc) 3. tax burden (CEER: ceer96tb) 4. rule of law (CEER: ceer97)	3.72* [0.84]	3.6* [0.78]	5.5* [1.4]	3.9* [0.8]			
STANDARD Measures 1. Inflation (logfsvia) 2. Internal liberalization (fsviii) 3. Privatization (largp)					-6.3* [1.9]	95.3* [25.9]	6.6** [3.1]
No. of obs	15	15	15	15	15	15	15
R-Squared	0.74	0.76	0.71	0.74	0.51	0.57	0.32

Table 10  
Stabilization Measures

RHS variable	LHS: 1994 share of unofficial economy						LHS: 1994 Kaufmann-adjusted GNP						LHS: 1994 Official Output					
	In total GNP		cons. & FSU		cons. & in.sh.		cons. only		cons. & FSU		cons. & in.sh.		cons. only		cons. & FSU		cons. & in.sh.	
Initial Share (DK: inshare)																		
FISU dummy (fsu)		11.8*																
Initial Output fall (falloff)																		
total output (falloff)																		
official output (falloff)																		
<b>STABILIZATION</b>																		
1. fiscal balance (FSV: fsvfisc)		-2.7*																
2. log inflation (FSV: logfsvia)		[0.4]																
1. fiscal balance (FSV: fsvfisc)																		
2. log inflation (FSV: logfsvia)																		
Number of Observations	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
R-Squared	0.76	0.89	0.79	0.74	0.79	0.74	0.35	0.55	0.80	0.52	0.59	0.82	0.53	0.87	0.69	0.69	0.86	0.75

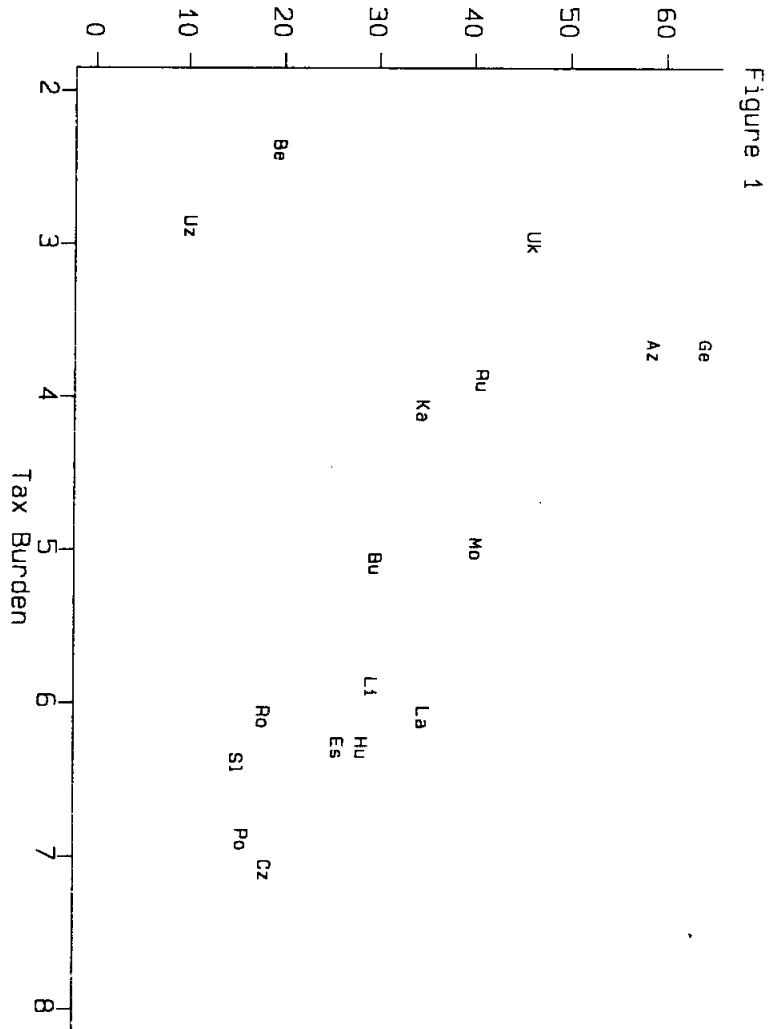
Standard errors are in brackets  
\* Significant at 5% level  
\*\* Significant 10% level



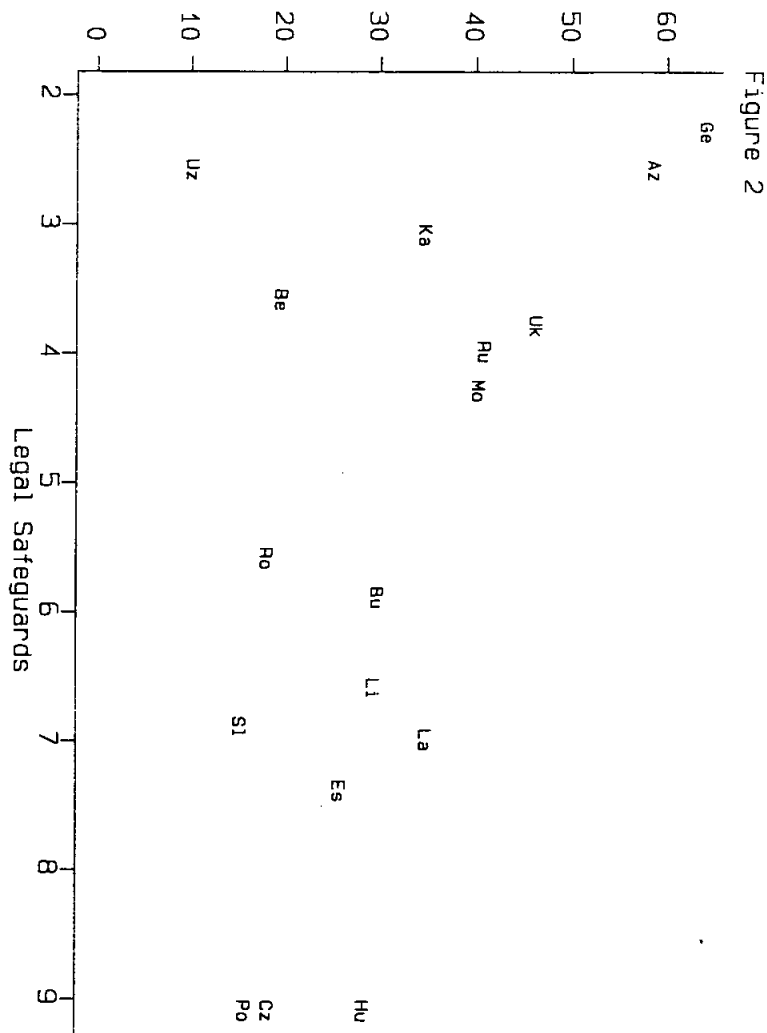
Table 11  
 PANEL DATA (fixed effects)  
 Total Output Regressions

RHS variable	Total Output 1989-94		Total Output 1992-94		Total Output 1992-95	
	w/o share	with share	w/o share	with share	w/o share	with share
Time relative to Start of Reform (refyear)	-4.1* [1.0]	-3.6* [1.0]	-2.2 [2.1]	0.1 [2.4]	-1.5 [1.4]	-1.5 [1.4]
STABILIZATION 1. log inflation (FSV: logfsvia)	-1.1** [0.6]	0.1 [0.65]	-1.3 [1.3]	-0.6 [1.3]	-0.01 [1.1]	0.16 [1.2]
LIBERALIZATION 2. internal liberalize (Gelb: fsviii)	-8.6* [5.2]	-8 [4.8]	-31.8** [16.1]	-24.5 [16.0]	-34.6* [10.4]	-32.8* [11.5]
PRIVATIZATION 3. privatization (EBRD: largp)	0.52 [1.5]	0.31 [1.4]	-3.4 [3.0]	-5.9** [3.2]	-1.7 [2.4]	-1.6 [2.4]
UNOFFICIAL ECON. 4. Share of unoff/total (DK: share)		-0.5* [0.1]		-0.6* [0.3]		-0.08 [0.2]
No. of obs	90	90	45	45	60	60
R-Squared within	0.76	0.79	0.56	0.61	0.54	0.54

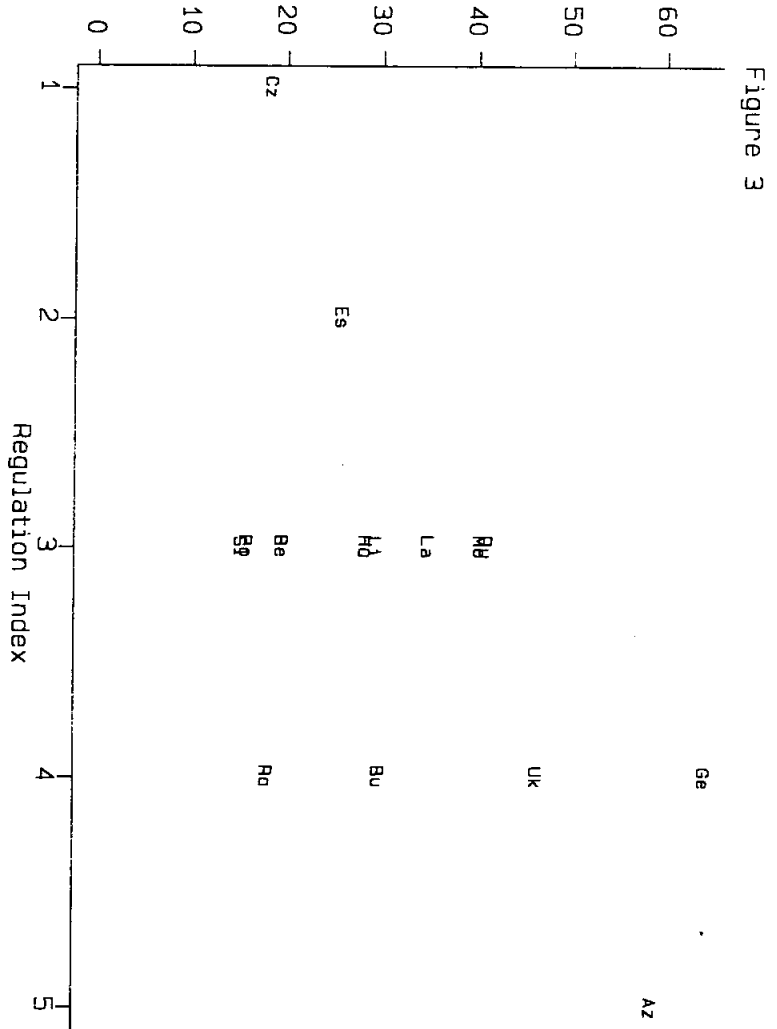
Share of Unofficial Economy in Total GDP



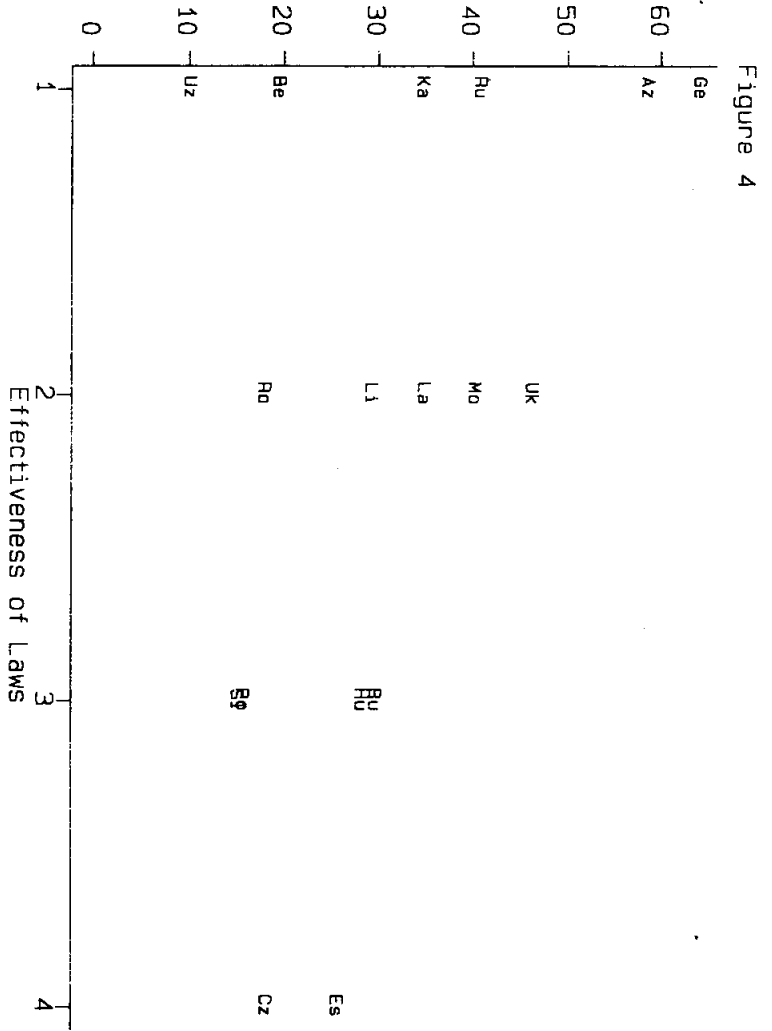
Share of Unofficial Economy in Total GDP



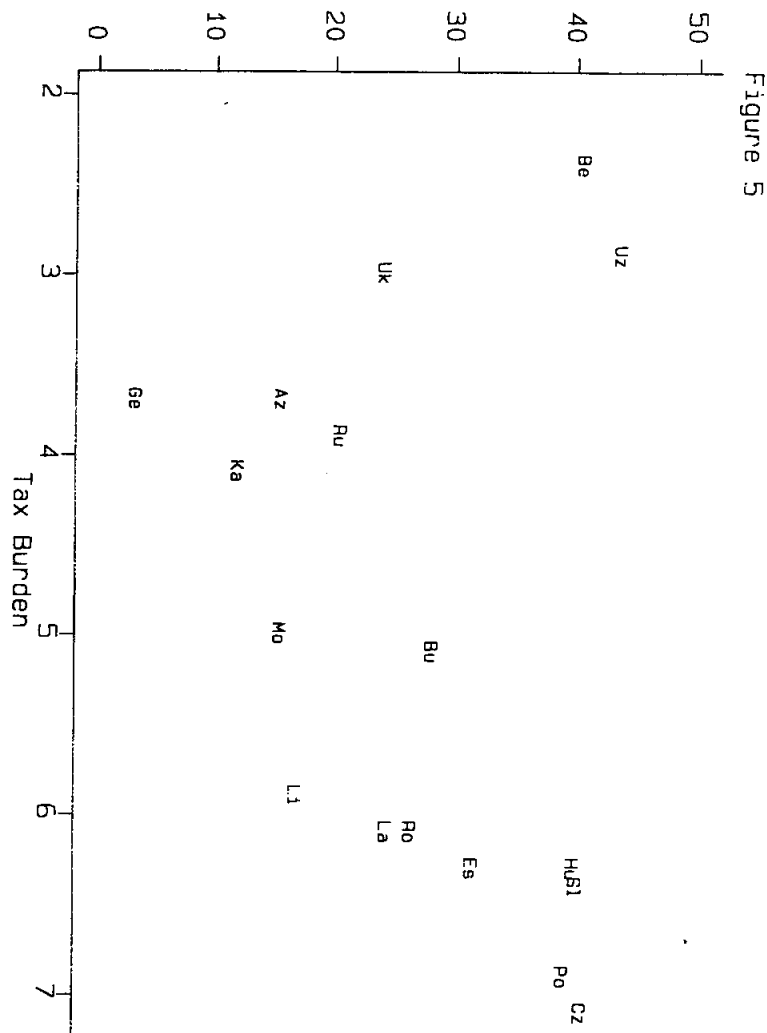
Share of Unofficial Economy in Total GDP



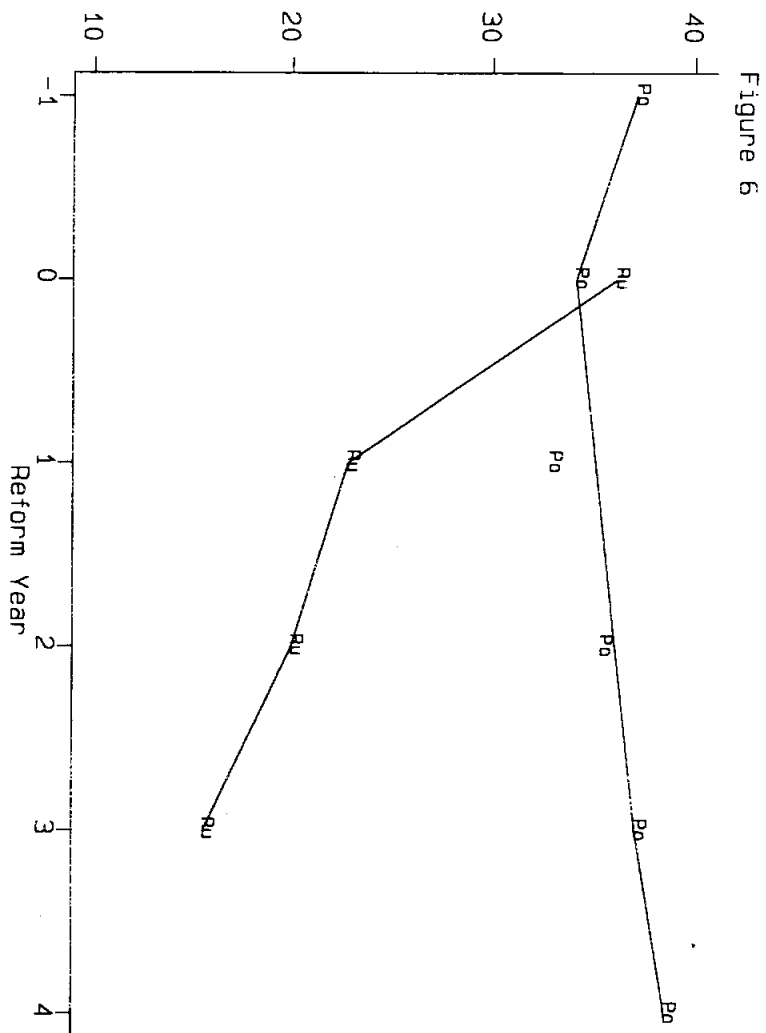
Share of Unofficial Economy in Total GDP



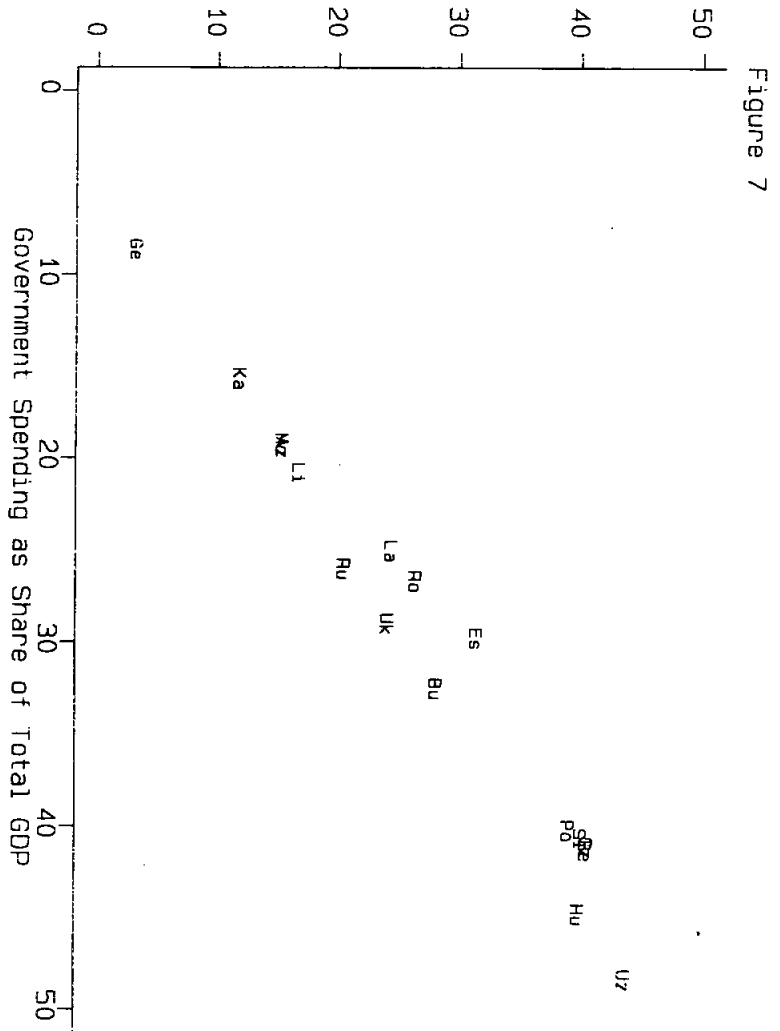
Tax Revenue as Share of Total GDP



Tax Revenue as Share of Total GDP

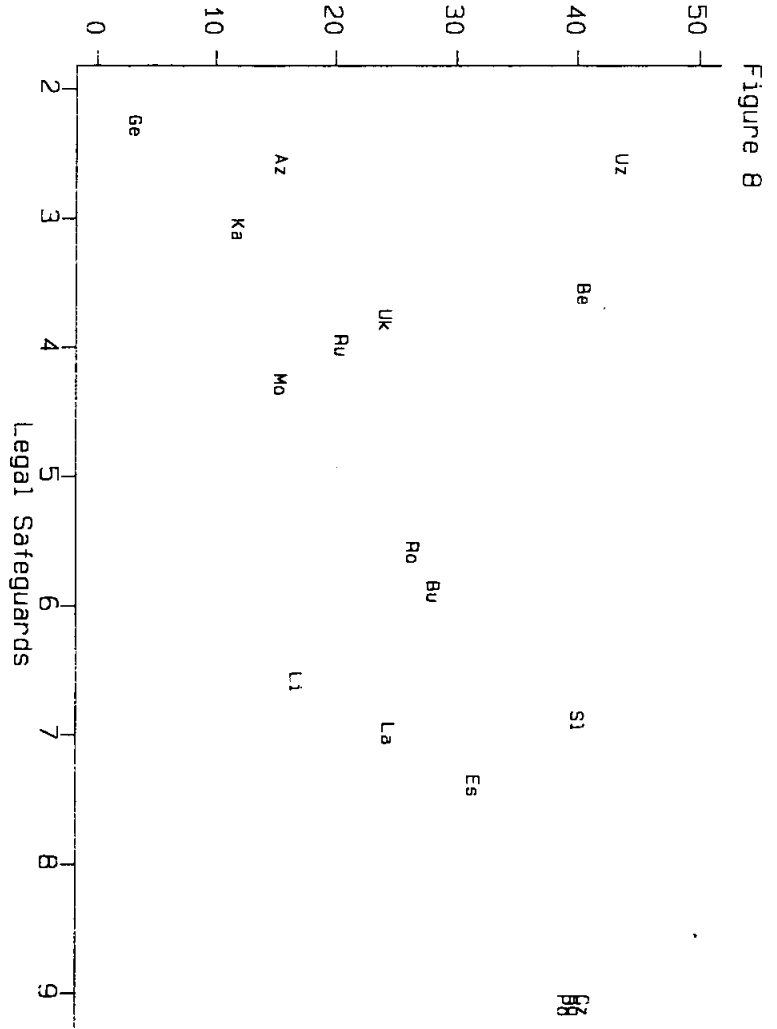


Tax Revenue as Share of Total GDP

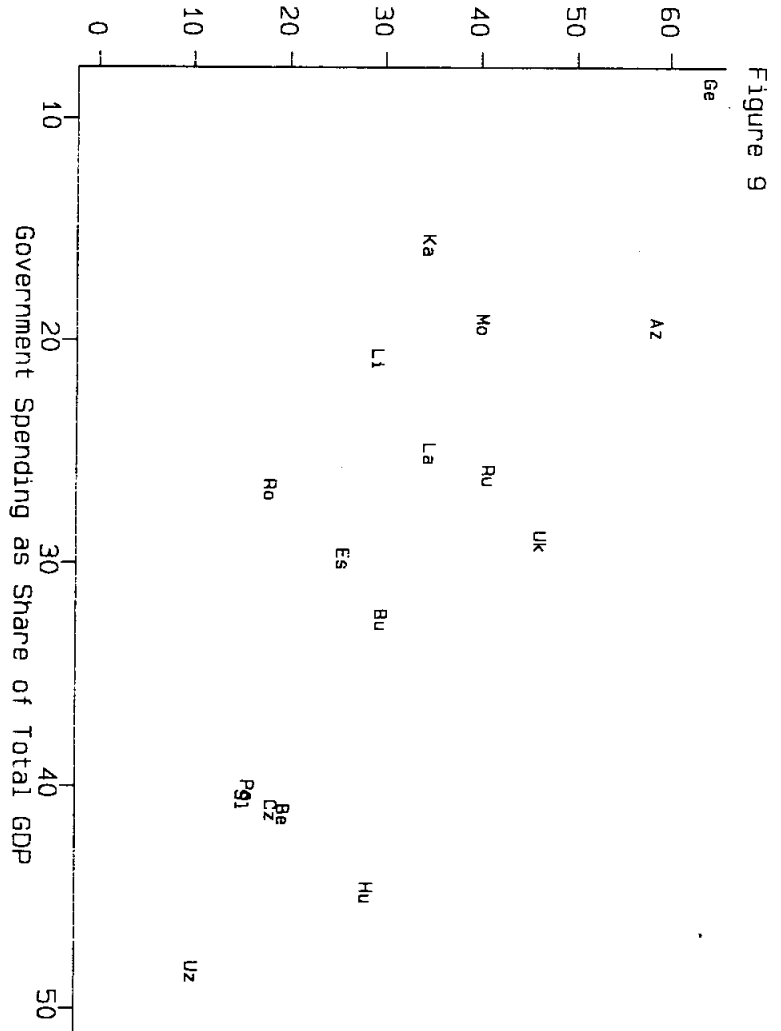




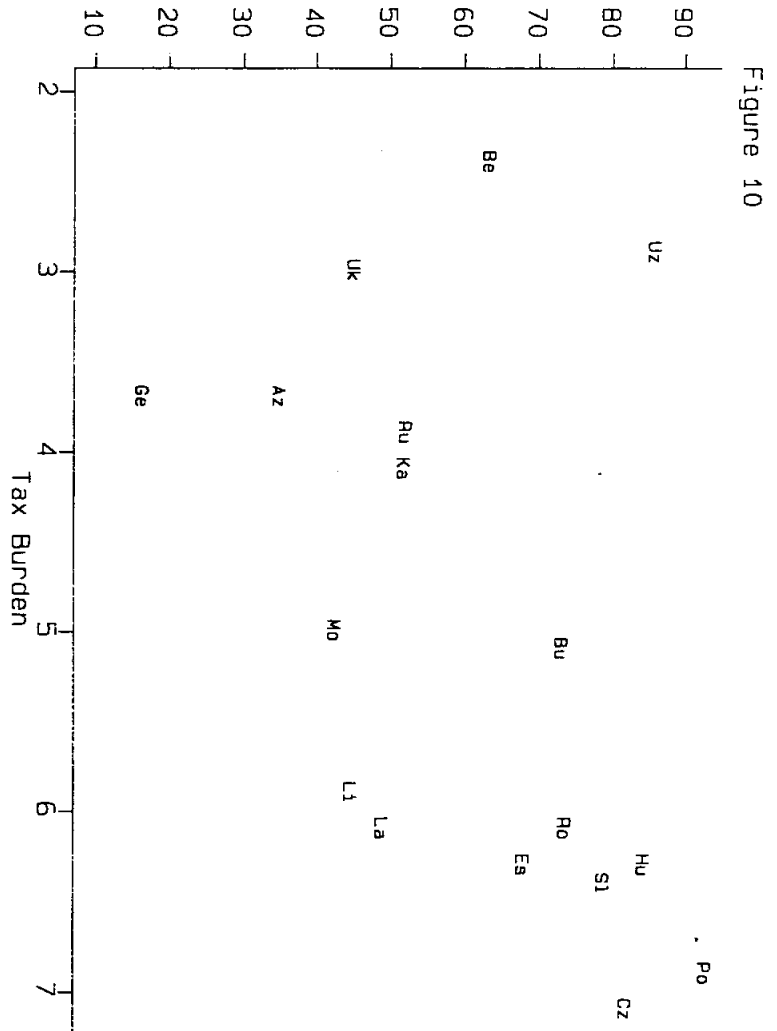
Tax Revenue as Share of Total GDP



Share of Unofficial Economy in Total GDP

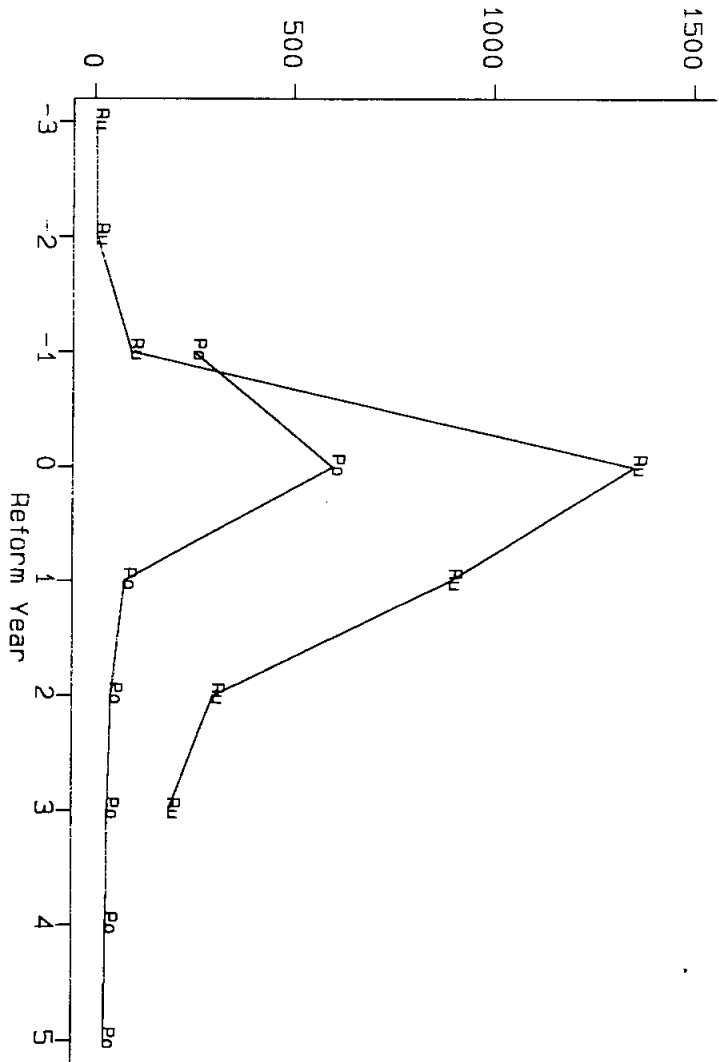


Official GDP in 1994, with 1989=100

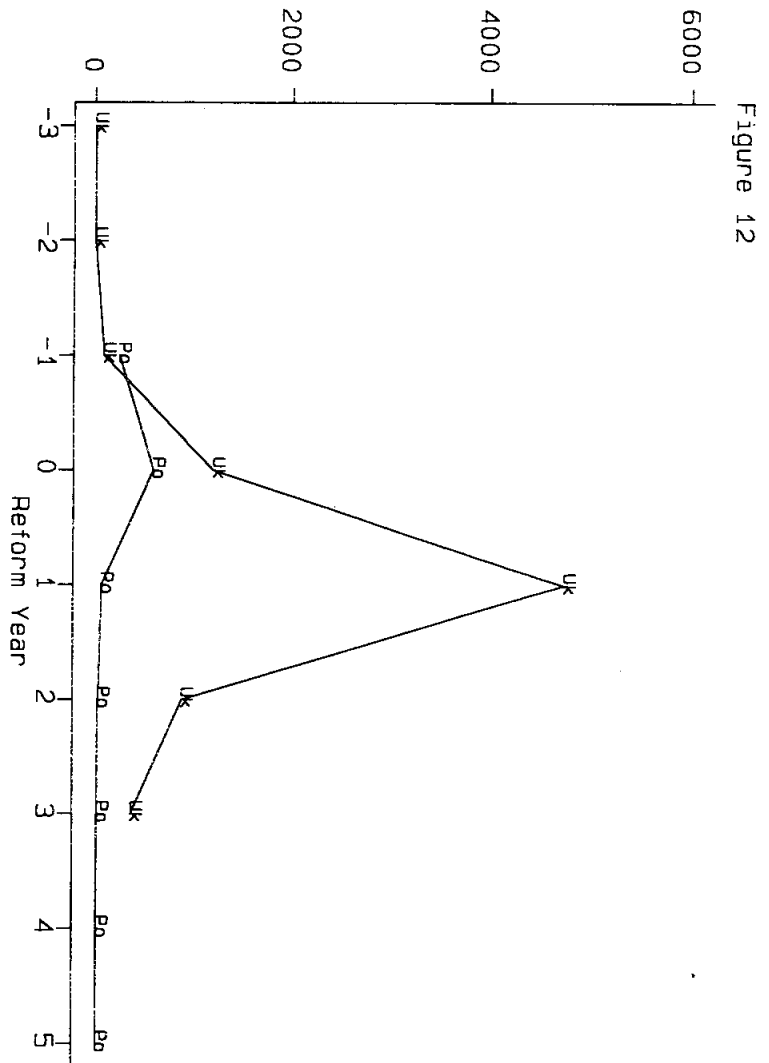


Inflation per annum

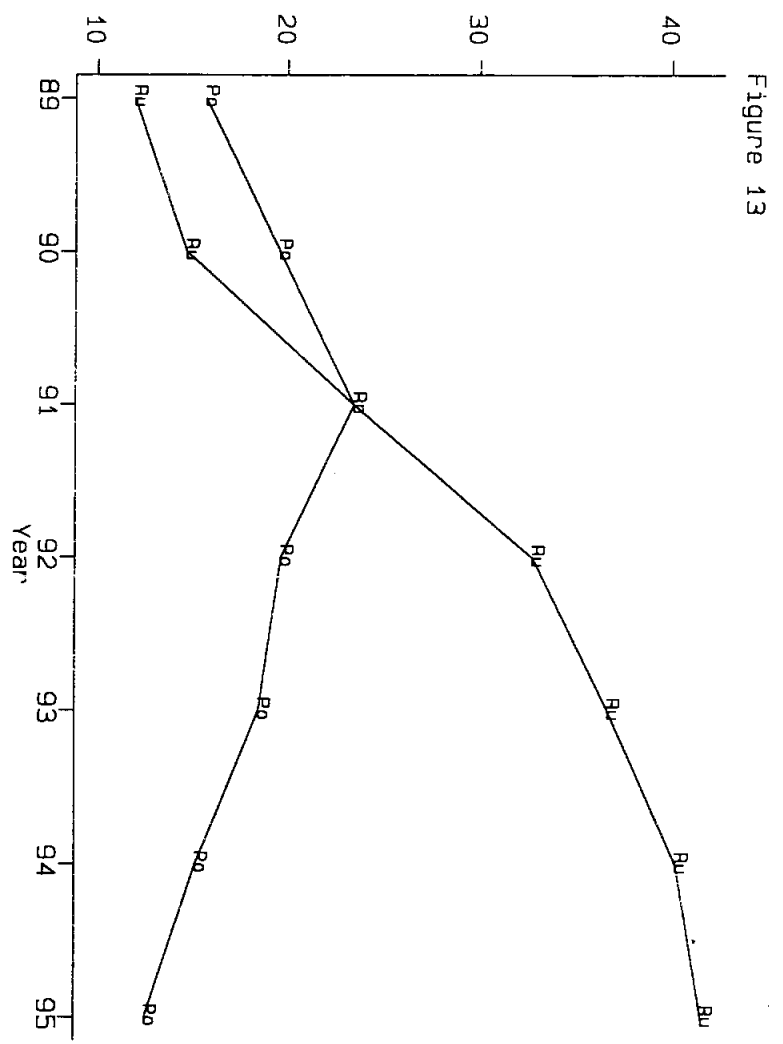
Figure 11



Inflation per annum



Share of Unofficial Economy in Total GDP



Total GDP

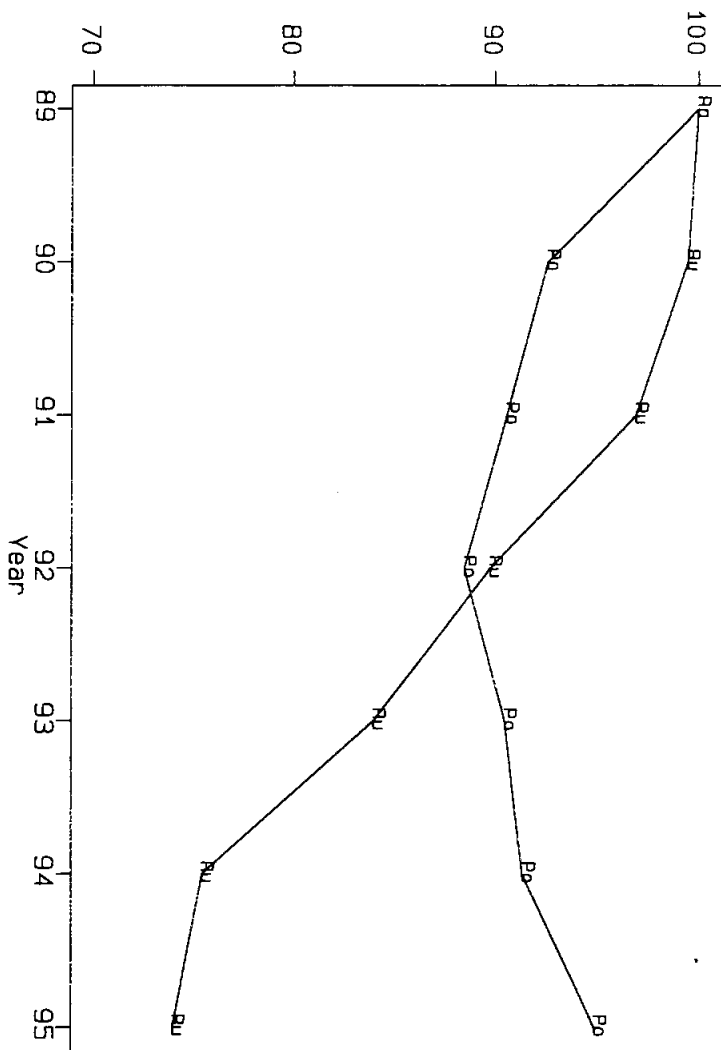


Figure 14