

REVENUE TRAPS

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When state officials care about tax revenue and factors of production are mobile across economic sectors, political economies organize themselves into equilibria where officials promote sectors to which resources are allocated, which in turn encourages that resource allocation. Differences across sectors in the ability of officials to extract revenues may result in a “revenue trap”: the persistence of a low-productivity equilibrium even in the presence of large shocks to resource allocation. I argue that the failure of privatization in part of the postcommunist world to effect a shift toward new private economic activity resulted in part from such a trap.

1. INTRODUCTION

WHY DO economies remain organized around unproductive activity when the possibility of evolution exists? A compelling answer to this question is that coordination failures prevent economic agents from taking actions – for example, investing in physical or human capital – which would be mutually beneficial (Bryant, 1983; Cooper and John, 1988; Diamond, 1982). The role of the government, from this perspective, is to help agents overcome these coordination problems (Murphy et al., 1989). Why governments do not do so is the partial focus of a vast literature in political science and economics on “bad” policy choice, which typically stresses one of two explanations: either political actors are interested in maximizing social welfare but have incorrect beliefs about how to do so, or they choose inefficient policies because they have interests other than welfare maximization in mind (Acemoglu, 2002; Robinson, 1998). In this article, I suggest an alternative explanation, one in which the coordination failure also involves the government. Political and economic actors, I argue, may be jointly dependent on the status quo, such that neither has an incentive to deviate even though both might be better off if they did so. As a consequence, economies may persist in an inefficient state even when political actors know what to do and in principle are willing to do it.

I focus in particular on the preference of political actors for more over less tax revenue (Brennan and Buchanan, 1980; Levi, 1988; North, 1981). Confronted with the choice of how to allocate spending on sector-specific public goods, political actors give preference to those sectors in which the

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anticipated payoff in the form of tax revenue is greatest. By and large, these are sectors to which factors of production have already been allocated. However, the owners of those factors choose whether or not to locate in a sector based in part on the public goods provided by the state. As a consequence, public-goods provision and factors of production pool together in particular sectors, but not all simultaneously.

This model of simultaneous allocation of political and economic resources suggests a “lumpiness” in the distribution of economic activity across political space. Figure 1, taken from World Bank (2002), illustrates in the context of postcommunist transition how such lumpiness may emerge. Under communism there were few small enterprises (Brown et al., 1994), and the development of a small-business sector in transition countries has been seen as largely synonymous with the creation of new private firms. Yet, despite strong evidence of the greater productivity of *de novo* enterprises relative to both privatized and state-owned enterprises (Havrylyshyn and McGettigan, 2000), the creation of a supportive political environment has been sharply uneven across the postcommunist world. As can be seen, by the late 1990s countries had sorted themselves into two groups: those (largely in Eastern Europe and the Baltics) where employment in small enterprises rivaled that in OECD countries, and those (mostly in the former Soviet Union less the Baltics) where the small-business sector was only marginally larger than under communism. Numerous studies have laid the blame for underdevelopment in the latter group at the feet of those countries’ political leaders and bureaucrats (Frye and Shleifer, 1997; Hellman et al., 2000), yet little consensus has emerged as to why those officials have been especially unsupportive.

I argue that many of these countries – like others around the world – are caught in a *revenue trap*. Even though both political and economic agents could, in principle, be better off in the “new” equilibrium than in the “old,” the dependence of state officials on existing sources of revenue, together with the unattractiveness to factor owners of employment in an alternative sector in the absence of public-goods provision to that sector, makes such a

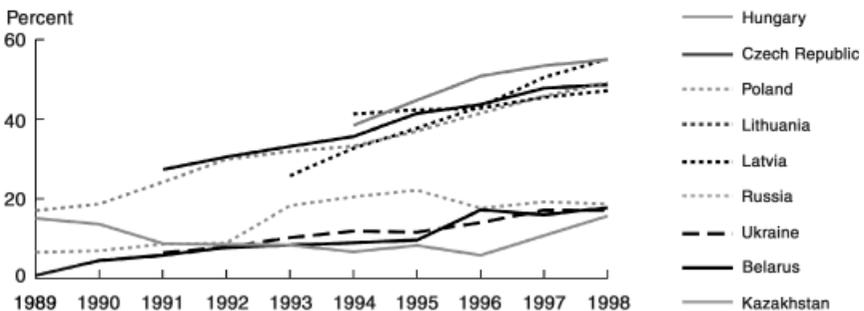


Figure 1. Share of employment in small enterprises, 1989–1998.

Source: World Bank (2002, p. 41).

transition unlikely. Mass privatization – carried out in most postcommunist countries by a narrow elite – held the promise of breaking this vicious cycle: seen from the perspective of rank-and-file bureaucrats and political leaders, this was a massive shock to resource allocation with the potential to change incentives and tip the political economy to a different equilibrium. In Eastern Europe and the Baltics this shock was sufficient; in the former Soviet Union (less the Baltics) it was not. The difference, I suggest, was the relative difficulty of taxing new enterprises in the latter group of countries. For reasons I discuss below, two very different revenue systems developed in the early 1990s after the collapse of the socialist state. The focus in the eastern half of the postcommunist world on taxing a few key economic sectors reduced the potential revenue importance of new private economic activity, and hence made it less likely that privatization would have the desired effect.

This paper touches on many of the themes of the literature on the fiscal incentives of politicians (Gordon and Li, 1997), including work emphasizing the influence of fiscal federalist systems in creating positive (as in China) or negative (as in Russia) incentives for local politicians to pursue policies that encourage economic growth.¹ However, most of this literature only considers the impact of government behavior on economic performance, and not the feedback from the latter to the former; as such, it does not explain the multiple equilibria predicted by this model and observed in reality. One exception is Berkowitz and Li (2000), but in their model the sector that is harder to tax (the unofficial sector) is less productive than the sector that is easier to tax. As I argue below, quite often the opposite is true.

Furthermore, this paper contributes to a growing literature investigating the role of initial conditions in producing divergent outcomes in the postcommunist world (Darden and Grzymala-Busse, 2006; de Melo et al., 2001; Fish, 2005; Kitschelt, 2003; Kopstein, 2003; Kopstein and Reilly, 2000; Pop-Eleches, 2006; Wittenberg, 2006) and elsewhere (Acemoglu et al., 2001, 2002; Engerman and Sokoloff, 2000).² Clearly, however, not all arguments about the role of initial conditions imply that postcommunist countries should have sorted themselves into disparate groups with very different political economies. Models of transition with multiple equilibria include Johnson et al. (1998) and Roland and Verdier (2003), each focusing on the allocation of economic activity to a “formal” and an “informal” economy. As in the model I present below, multiple equilibria exist in these models, due to a public-goods externality from factor allocation to a particular sector.

¹On fiscal federalism, see e.g. Oi (1992) and Qian and Weingast (1996) on China, and Treisman (1999), Zhuravskaya (2000), and Sonin (2003) on Russia. Cai and Treisman (2004) suggest that fiscal federalism created incentives for local officials in *both* Russia and China to attract outside capital, but that officials in each country did so in a way that “corroded” the central state.

²Other scholars have instead stressed the importance of political institutions and strategies that arose in the course of transition. Representative and important works include Aslund et al. (1996) and Hellman (1998).

However, the mechanism and implications are different. In the informal-economy models public-goods provision (by the state or “mafia”) arises mechanically when a sector (formal or informal) grows in size, and it is coordination problems among factor owners that lead to the bad (mafia) equilibrium. In principle, then, state policy can encourage actors to locate in the formal sector when the economy is not in equilibrium. In contrast, in my model the state is a strategic and monopoly supplier of public goods to two “formal” sectors, and is itself part of the coordination problem.

The paper is organized as follows: in the next section I present a simple model to illustrate the outcomes possible when state officials care about tax revenue and factors of production are mobile across sectors. In section 2 I use the model to organize discussion of the impact of privatization – a shock to resource allocation that was expected to produce an equilibrium shift – on the political economies of postcommunist Europe, and argue that in many of these countries a revenue trap has prevented privatization from having the expected impact. I offer concluding thoughts in section 3.

2. MODEL

2.1 *Environment and Equilibrium*

Consider an economy in which there are two economic sectors, indexed by $S \in \{O, N\}$, where O represents an “old” sector and N a “new” sector. For simplicity, assume labor to be the sole private factor of production, with total labor supply perfectly inelastic and normalized to one.³ Labor is completely mobile across sectors, with the (endogenous) proportion of labor in sector S equal to L_S . (In what follows, I often refer to “resources” or “factors of production” rather than labor.) Labor is homogeneous, and production from labor is augmented by a sector-specific productivity parameter α_S and sector-specific public good q_S , so that total output in sector S is $Y_S = \alpha_S L_S q_S$. In the discussion I often focus on the case where the new sector is inherently more productive, so that $\alpha_N > \alpha_O$.

Simultaneously with the allocation of labor across sectors, a politician decides on the provision of public goods. The assumption that the politician and labor move simultaneously captures the idea that the politician cannot precommit to a particular allocation of public goods, as he is dependent on existing sources of revenue to fund both public-goods production and any use of tax revenue for political or personal use. I assume that the politician maximizes tax revenue net of the cost of providing such goods, where an exogenous proportion τ_S of production in sector S is extracted as tax revenue, with the remainder retained by labor. The parameter τ_S should not be

³Elasticity of total labor supply can be easily incorporated into the model, with no change in the main qualitative results, by assuming that there is an alternative sector R that is non-productive (or at least nontaxable) and that provides utility to labor of $u(L_R)$, with u concave and certain limit conditions assumed.

thought of as a tax rate, but as the *taxability* of a sector, i.e. the ability of the state to identify sources of revenue and lay claim to them. In the following section, I present evidence that there was in fact a sizable difference in the taxability of new and old economic activity in parts of the postcommunist world, such that τ_N was less than τ_O . More generally, sectors may differ in their taxability because of organizational or technological characteristics (size, ownership, industrial sector, etc.) that make it relatively easy or difficult for tax authorities to observe and seize revenues.⁴

In particular, assume that the politician decides on both an allocation $\beta \in (0, 1)$ of tax revenue to public-goods production (with the remainder retained for personal or political use), and a division (λ_O, λ_N) of the total production of public goods q into that provided to sector O and that to sector N , so that $q_S = \lambda_S q$ and $(\lambda_O + \lambda_N) = 1$.⁵ Aggregate public-goods production q is given by the public-goods production function

$$q = [\beta(\tau_O Y_O + \tau_N Y_N)]^\gamma = [\beta(\tau_O \alpha_O L_O \lambda_O q + \tau_N \alpha_N L_N \lambda_N q)]^\gamma,$$

where $\gamma \in (0, 1)$ is a parameter of the model. Solving for q gives

$$q = [\beta(\tau_O \alpha_O L_O \lambda_O + \tau_N \alpha_N L_N \lambda_N)]^{\frac{\gamma}{1-\gamma}}.$$

Thus, the politician (taking L_O and L_N as given) solves

$$\begin{aligned} & \max_{\lambda_O, \lambda_N, \beta} (1 - \beta)\tau_O \alpha_O L_O (\lambda_O q) + (1 - \beta)\tau_N \alpha_N L_N (\lambda_N q) \\ \text{s.t. } & q = [\beta(\tau_O \alpha_O L_O \lambda_O + \tau_N \alpha_N L_N \lambda_N)]^{\frac{\gamma}{1-\gamma}} \\ & \lambda_O + \lambda_N = 1, \end{aligned}$$

i.e.

$$\max_{\lambda_O, \beta} (1 - \beta)\beta^{\frac{\gamma}{1-\gamma}} [\tau_O \alpha_O L_O \lambda_O + \tau_N \alpha_N L_N (1 - \lambda_O)]^{\frac{1}{1-\gamma}}.$$

Clearly, this problem is separable in β and λ_O . The expression $(1 - \beta)\beta^{\gamma/(1-\gamma)}$ is quasiconcave in β , so that the first-order condition $\beta = \gamma$ defines the politician's optimal allocation of tax revenue to public-goods production. Intuitively, the better is the public-goods production technology (in the sense of smaller diminishing returns), the more the politician is motivated to take a small slice of a large pie rather than a large slice of a small

⁴In particular, we can easily incorporate into the model a decision by owners of labor to hide some portion of their production from the state, where the marginal cost of hiding production varies across sectors and τ_S is that portion of production (net of the cost of hiding) that is unhidden and taxed by the state. For details, see Gehlbach (2006). In the context of the present model, the parameter α_S may then represent both the inherent productivity of a sector and the cost of hiding production, where for a given level of inherent productivity the parameter α_S is lower when more production is destroyed in the process of hiding revenue from the state.

⁵In an extended model, we might further assume that some proportion of public-goods production benefits both sectors. The main qualitative results of the model are more likely to hold, the smaller is that proportion.

pie. With respect to allocation of public-goods provision across sectors, the politician provides public goods only to the old sector (i.e. chooses $\lambda_O = 1$) if $\tau_O \alpha_O L_O > \tau_N \alpha_N L_N$, and only to the new sector if $\tau_O \alpha_O L_O < \tau_N \alpha_N L_N$. Similarly, given complete factor mobility and the assumption that labor retains a proportion $(1 - \tau_S)$ of the production in sector S , labor locates entirely in the old sector if $(1 - \tau_O) \alpha_O \lambda_O > (1 - \tau_N) \alpha_N \lambda_N$, and entirely in the new sector if $(1 - \tau_O) \alpha_O \lambda_O < (1 - \tau_N) \alpha_N \lambda_N$.

Thus, labor allocation and public-goods provision are strategic complements: both owners of labor and the politician are more likely to devote resources to a particular sector if the other does. As is often the case in games of this sort, there are multiple equilibria. In particular, there are two stable equilibria: an “old” equilibrium in which labor and public goods are allocated entirely to the old sector, and a “new” equilibrium in which they are allocated entirely to the new sector. In addition, there is an unstable intermediate equilibrium defined by the indifference conditions for collective-goods provision and labor allocation:

$$\frac{L_N}{L_O} = \frac{\tau_O \alpha_O}{\tau_N \alpha_N},$$

$$\frac{\lambda_N}{\lambda_O} = \frac{(1 - \tau_O) \alpha_O}{(1 - \tau_N) \alpha_N}.$$

The mutual dependence of the politician and labor within any sector implies that economic activity and political support stabilize around particular types of economic activity: the politician provides public goods to an existing sector because of its revenue importance, while resources remain allocated to that sector because of public-goods provision. Such symbiotic relationships may characterize a large number of political economies and, as I demonstrate in the discussion below of revenue traps in the postcommunist world, they can be quite hard to break out of.

2.2 *Resistance to Shocks*

I am especially interested in the possibility that the new sector may be more inherently productive than the old (i.e. that $\alpha_N > \alpha_O$), but that the political economy remains stuck in the “old” equilibrium even in the presence of large shocks to resource allocation. As I relate below, mass privatization in transition countries – carried out by a narrow elite taking advantage of a “window of opportunity” before conventional politics resumed – was such a shock. So is the reallocation of labor that results from a natural disaster or a war. For example, Hurricane Katrina caused a massive migration of labor from the Gulf Coast region, and also a reallocation of labor out of sectors (such as riverboat and barge gambling) whose capital stock was destroyed in the storm. In disequilibrium situations such as these, the political economy may tip to the “new” equilibrium if the shock is sufficiently large to effect a

change in political support and if such a change comes about before resources have a chance to pool back into the old sector. When the revenue importance of the old sector to the politician is such that even large shocks are not sufficient to result in an equilibrium shift, we say the economy is stuck in a *revenue trap*.

What sort of shock would be necessary to result in a shift towards an equilibrium preferred over the status quo by both the politician and labor? Clearly, either extreme equilibrium is stable in the sense that the economy always reverts to the status quo so long as there are only small deviations from equilibrium behavior. As the following section relates, precisely this logic motivated mass privatization in postcommunist countries (carried out by a narrow group of reformers other than the “politician” in the model), as it was felt that the incentives of government officials would change only in response to a large shock to resource allocation. In the context of this model, the implicit assumption behind this argument is that the politician would adjust more quickly than labor to changing circumstances, as without a corresponding change in public-goods provision labor would flow back into the old sector. Thus, a large shock to resource allocation is a necessary, but not sufficient, condition for an equilibrium shift.⁶

Formally, assume that resources and public goods are initially allocated to the old sector, and let δ be the proportion of labor reallocated to the new sector in response to some exogenous shock to resource allocation. Then the old equilibrium is *resistant* to this shock if the politician’s best response to δ is to allocate public goods to the old rather than to the new sector:

$$\tau_O \alpha_O (1 - \delta) \geq \tau_N \alpha_N \delta. \quad (1)$$

Clearly, we can always find a δ large enough that the old equilibrium could give way to the new, but in practice there are limits to the size of exogenous shocks that may occur. As I discuss below, even mass privatization in transition countries – one of the largest shocks to resource allocation in economic history – transferred a relatively small share of resources into truly “new” economic activity.

In particular, condition (1) shows that the old equilibrium is resistant to larger shocks when the new sector is relatively difficult to tax, i.e. when the ratio τ_N/τ_O is small. The politician, forced to decide whether to abandon an aging and inherently less productive sector, is less likely to do so when that sector more easily surrenders the tax revenue that he find politically and personally valuable. Thus, revenue traps may be more likely when the old sector is more taxable than the new.

⁶It is worth emphasizing that if the shock were instead to public-goods allocation the ball would be in labor’s court. However, at least in the transition context the primary shock was to resource allocation through privatization.

2.3 Welfare

We have characterized the new sector as inherently more productive than the old, but is it necessarily more efficient? Put differently, given the constraints imposed by the political environment (including differences in taxability of the two sectors), how concerned should we be that the old equilibrium may be resistant to exogenous shocks to resource allocation?

We say that an equilibrium organized around some sector is (*constrained*) *socially efficient* when the value given by some social welfare function that takes as arguments the utility of *all* members of society, i.e. not only the politician and labor but also nonstrategic and unmodeled players, is greater in that equilibrium than in the other stable equilibrium. To characterize this in a reduced-form way, assume that social welfare in the equilibrium where resources and public goods are concentrated in sector S can be represented by

$$W_S(\tau_S, \alpha_S, \mu) = [(1 - \tau_S) + \mu(1 - \gamma)\tau_S] (\alpha_S)^{\frac{1}{1-\gamma}} (\gamma\tau_S)^{\frac{\gamma}{1-\gamma}}, \quad (2)$$

where $\mu \in [0, 1]$ is a parameter that measures the weight given to tax revenue retained by the politician and $(\alpha_S)^{1/(1-\gamma)} (\gamma\tau_S)^{\gamma/(1-\gamma)}$ is the equilibrium level of production in sector S . When $\mu = 0$, W_S is equal to labor's after-tax income, whereas when $\mu = 1$, W_S is the entirety of production retained by labor and the politician.

Clearly, the new equilibrium may be socially efficient even while the old equilibrium is resistant to large shocks to resource allocation. To see this most clearly, let μ approach 1 so that the new equilibrium is socially efficient if

$$(1 - \gamma\tau_N)(\alpha_N)^{\frac{1}{1-\gamma}} (\gamma\tau_N)^{\frac{\gamma}{1-\gamma}} \geq (1 - \gamma\tau_O)(\alpha_O)^{\frac{1}{1-\gamma}} (\gamma\tau_O)^{\frac{\gamma}{1-\gamma}},$$

i.e. if

$$\left(\frac{1 - \gamma\tau_N}{\tau_N}\right)^{1-\gamma} \tau_N \alpha_N \geq \left(\frac{1 - \gamma\tau_O}{\tau_O}\right)^{1-\gamma} \tau_O \alpha_O.$$

Then together with condition (1), we can define the condition for the new equilibrium to be socially efficient but the old equilibrium to be resistant to some exogenous shock δ as

$$\left(\frac{1 - \gamma\tau_O}{1 - \gamma\tau_N} \cdot \frac{\tau_N}{\tau_O}\right)^{1-\gamma} \leq \frac{\tau_N \alpha_N}{\tau_O \alpha_O} \leq \frac{1 - \delta}{\delta}.$$

When the old sector is relatively more taxable, i.e. when $\tau_N < \tau_O$, then the left-most term is less than 1, whereas for all $\delta < \frac{1}{2}$ (i.e. for all shocks to resource allocation that leave at least half of labor in the old sector) the right-most term is greater than 1, so that for some α_N and α_O the condition is met.

On the other hand, economic activity in one sector may be inherently more productive than that in another (as captured by the parameter α_S), but

the equilibrium organized around that sector may not be socially efficient because of differences in the taxability of the two sectors. To be more precise, the equilibrium in support of sector S is less likely to be socially efficient, the farther τ_S is from the socially optimal taxability (which I denote τ^e), which I derive from the definition of social efficiency [equation (2)] as

$$\tau^e = \frac{\gamma}{1 - \mu(1 - \gamma)}.$$

Thus, for example, the old equilibrium may be preferable to the new if $\tau_N < \tau_O < \tau^e$, as in weak states that find it especially difficult to raise revenue from any source but particularly so from new economic activity, or if $\tau_N \ll \tau^e < \tau_O$, as when the economy is “cursed” by government reliance on highly taxable natural resources. Given the contribution of public goods to production, an inability to tax a promising sector may render reliance on an inherently less productive sector second best.

The ideal would seem to be for the new sector to be both inherently more productive, and for the taxability of the new sector to be greater than the old (so the old equilibrium is less resistant) and closer to the socially optimal taxability τ^e . These conditions – likely rare in practice – seem to have been met by the township-village (i.e. municipally owned) sector in China, which during the takeoff in rural industry under Deng Xiaoping benefited from state support due to the ability of local officials to claim a portion of such firms’ profits, and may also have been inherently more productive than the traditional industrial and agricultural sectors (Che and Qian, 1998; Jin and Qian, 1998; Oi, 1992).

2.4 *Necessity of Government Support*

The emphasis of this paper is on situations in which political actors and factor owners are stuck in one equilibrium but another, potentially more productive, equilibrium exists. There may, however, be other environments in which it is impossible even in principle to break out of the old equilibrium. In particular, public goods may be relatively more important to the new sector, as in postcommunist countries where private economic activity of any real scale required the active intervention of the state to create the legal and institutional infrastructure that would allow markets to function. To the extent that the old sector can continue to function even without continued investment in public goods, then it is possible that the “old” equilibrium is the only equilibrium.

Consider, for example, a modified production function for the old sector $Y_O = \alpha_O L_O(q_O + \bar{q}_O)$, where the parameter $\bar{q}_O > 0$ is the “inherited” public-goods provision to the old sector. Then the new equilibrium does not exist if the marginal return to labor in the old sector is greater than that in the new

sector, even when all labor is allocated to the new sector:

$$(1 - \tau_O)\alpha_O\bar{q}_O > (1 - \tau_N)(\alpha_N)^{\frac{1}{1-\gamma}}(\gamma\tau_N)^{\frac{\gamma}{1-\gamma}}.$$

Clearly, this inequality is more likely to hold when $(\alpha_O\bar{q}_O)$ is larger. More interestingly, the condition may also hold if the taxability of the new sector is sufficiently low relative to that of the old sector: if the new sector does not provide the resource base for public-goods production to take place, resources may flow back into the old sector even when it is unsupported by the politician. To see this most clearly, let $\tau_O = (\tau_N + \Delta)$, $\Delta > 0$. Then as τ_N approaches zero the condition becomes

$$(1 - \Delta)\alpha_O\bar{q}_O > (1)(\alpha_N)^{\frac{1}{1-\gamma}}(\gamma)^{\frac{\gamma}{1-\gamma}}(0) = 0.$$

It is worth noting that taxability of the new sector sufficiently *high* is also a sufficient condition for the old equilibrium to be unique, as then private investment in the new sector is unattractive despite public-goods provision to that sector. However, this is an unlikely scenario in many political-economic environments, where the state is constrained in its ability to collect revenue from all sources, but most especially from new types of economic activity. As I argue below, precisely this pattern in the ability of the state to collect revenue from the new and old economy emerged following the collapse of communism in Eastern Europe and the Soviet Union, with the relationship especially clear in parts of the eastern half of the postcommunist world.

3. REVENUE TRAPS AND PRIVATIZATION IN POSTCOMMUNIST EUROPE

In the early 1990s in postcommunist Europe, the key question for many policy-makers, advisors and scholars was how to effect a shift from an old equilibrium in which the state was heavily involved in the economy and most individuals and capital were employed in state-owned enterprises, to a new equilibrium with state support for an economy in which private enterprise would be predominant. Privatization was seen as the central element of a strategy to make this happen. What was necessary was to create a “private property regime” – a “social and economic order defining a new set of expectations that individuals may have with respect to their ability to dispose of the assets recognized as ‘theirs’ by the legal system” (Frydman and Rapaczynski, 1994, p. 169) – as well as to provide the necessary conditions for private property to be profitably employed. But, paradoxically, such an environment could not be created in the absence of private property, as the state would have no interest in providing the necessary institutions. Privatization, enacted during the “window of opportunity” (Balcerowicz, 1994) opened briefly by the collapse of the ancien regime, would create the constituency necessary for these institutions to develop, providing political pressure on the state long after the privatizers had disappeared from the

political scene (Boycko et al., 1995; Roland and Verdier, 1994; Schmidt, 2000).

In essence, what many officials and analysts seemed to have in mind was a variant of the model presented in section 2, where future policy-makers would allocate public goods in proportion to the size (and thus political importance) of a sector:

$$\begin{aligned} & \max_{\lambda_O, \lambda_N} \alpha_O L_O (\lambda_O q) + \alpha_N L_N (\lambda_N q) & (3) \\ & \text{s.t. } q = (\tau_O \alpha_O L_O \lambda_O + \tau_N \alpha_N L_N \lambda_N)^{\frac{1}{1-\tau}} \\ & \lambda_O + \lambda_N = 1. \end{aligned}$$

In this formulation, tax revenue is allocated mechanically to public-goods production, with the politician responsible only for deciding on the division of public-goods spending across sectors. As in the model in the previous section, there is both an “old equilibrium” and a “new equilibrium” of this game. The hope was that privatization, carried out by a small group of reformers with objectives different from those defined in expression (3), would force the hand of future generations of policy-makers. With factors of production relatively immobile in the short run, state behavior would tip toward support of new, private economic activity if mass privatization pushed L_N/L_O high enough, resulting in a shift to a new equilibrium.⁷

How successful were the architects of privatization in achieving this goal? To answer this question, we must be more precise about what “new” is. If one takes “new” to be private as opposed to state-owned economic activity, then by the standard of an equilibrium shift privatization must be judged a general success. Across the postcommunist world, property that has been privatized has stayed largely in private hands. Although a societal consensus has not formed everywhere in support of private property, there has been no major attempt by political elites to renationalize formerly state-owned property, and no major reallocation of resources out of the private sector back into that portion of the state sector that remains.⁸ The “mass” nature of privatization in most postcommunist countries (see e.g. the comparative

⁷Frictions in labor and capital markets figure prominently in much empirical and theoretical work on transition. For evidence from Eastern Europe, see Boeri and Flinn (1999); for Russia, Andrienko and Guriev (2002). Aghion and Blanchard (1994) discuss the consequences of labor-market frictions for the optimal speed of reform. Roland and Verdier (1999) explore the possibility that search frictions in capital markets explain the output fall that followed liberalization.

⁸There are exceptions. In Russia, for example, there has been some attempt by governors to acquire ownership of enterprises that have accumulated large debts to regional governments; see e.g. Barnes (2003). Similarly, the legal assault on oil major Yukos has been interpreted as renationalization, and the Kremlin does seem intent on returning some of the most profitable resource-extraction companies to the state fold. Nonetheless, for the moment these appear to be the exceptions that prove the rule. On changes in attitudes as a result of privatization, see Earle and Gehlbach (2003).

privatization indexes in Table 1), in which L_N/L_O reached very high levels, likely has much to do with the unwillingness of postcommunist politicians to seriously attempt renationalization.

However, with the benefit of hindsight, it seems clear that the better definition of “new” is truly new economic activity. Across the postcommunist world, the performance of *de novo* enterprises has outstripped that of privatized enterprises (Havrylyshyn and McGettigan, 2000), and the growth of this sector is now seen as a key element of transition. Nonetheless, despite the seeming efficiency benefits of promoting such economic activity, not all states have shown the same interest in providing an environment in which new firms can flourish, and in particular one in which the public goods of a supportive legal environment and an efficient and honest bureaucracy are present. Although data on small-enterprise employment are not everywhere available and are not always consistent across countries, in general there seems to be a “great divide” (Berglof and Bolton, 2002) between Eastern Europe and the Baltics on the one hand and the former Soviet Union less the Baltics (the Commonwealth of Independent States, or CIS) on the other. In the former group of countries state officials are generally supportive of new business activity, with a corresponding flow of labor and capital into *de novo* (i.e. small) enterprises, whereas in the latter both state support and factors of production have largely remained in the old (state and privatized) sector.⁹

What accounts for this divide? I believe many countries in postcommunist Europe are caught in a revenue trap, with politicians dependent on the inefficient old (state-owned and privatized) sector as a source of revenue, and labor and capital unwilling to migrate to new economic activity until the state provides the public goods necessary for *de novo* firms to flourish. This revenue trap has its roots in the need, shared by all postcommunist countries in the early 1990s, to create a tax system capable of extracting revenues from a market economy more or less from scratch. Countries in the CIS largely went about this task in a different way than did those in Eastern Europe and the Baltics. As a consequence, many states in the CIS have found themselves comparatively dependent on revenue from old (state-owned and formerly state-owned) enterprises, thus reducing the incentive for politicians to provide public goods to the *de novo* sector.

All postcommunist countries were gripped by fiscal crises in the early 1990s, so the assumption of the model presented in the previous section that the politician is motivated to maximize tax revenue is likely a better approximation of the preferences of postcommunist officials than is the

⁹In addition to the works cited earlier, see e.g. the analyses of firm-survey data in Pop-Eleches (1998), Johnson et al. (2000), Frye and Zhuravskaya (2000), Hendley et al. (2001), CEFIR and World Bank (2002), and Frye (2002). World Bank (2002) discusses the equivalence of “small” and “new” in the postcommunist world. Boeri and Terrell (2002) review the evidence on labor reallocation.

TABLE 1 PRIVATIZATION, INITIAL CONDITIONS, AND TAX COLLECTION IN POSTCOMMUNIST COUNTRIES

	Large-scale privatization	Small-scale privatization	Over-industrialization	Natural resources	1989 GNP per capita at PPP, USD	CIT as percentage of all taxes, 1999–2000	CIT: effective/statutory taxation, 1997	Revenue reporting: new/old firms
EE and Baltics								
Albania	2	4	3	0	1,400	8.9	NA	1.13
Bulgaria	3	3+	23	0	5,000	10.0	0.31	0.87
Croatia	3	4+	1	0	6,171	3.5	NA	1.08
Czech Republic	4	4+	21	0	8,600	10.1	0.23	0.86
Estonia	4	4+	10	0	8,900	4.4	0.22	0.93
Hungary	4	4+	-1	0	6,810	6.2	0.26	0.97
Latvia	3	4	10	0	8,590	6.3	0.23	1.00
Lithuania	3	4+	10	0	6,430	2.6	0.13	0.93
Macedonia	3	4	9	0	3,394	3.7	NA	0.94
Poland	3+	4+	13	1	5,150	7.7	0.2	0.99
Romania	3-	4-	22	1	3,470	9.7	0.21	0.91
Slovakia	4	4+	23	0	7,600	8.5	0.22	0.96
Slovenia	3	4+	5	0	9,200	3.0	0.15	0.94
CIS								
Armenia	3	3+	20	0	5,530	11.4	0.16	0.99
Azerbaijan	2-	3+	8	2	4,620	16.0	0.12	1.01
Belarus	1	2	12	0	7,010	19.2	0.39	0.91
Georgia	3+	4	8	1	5,590	8.2	0.04	0.99
Kazakhstan	3	4	-4	2	5,130	NA	0.15	0.98
Kyrgyzstan	3	4	6	0	3,180	6.3	0.06	0.97
Moldova	3	3+	2	0	4,670	7.3	0.18	0.79
Russia	3+	4	7	2	7,720	16.9	0.33	0.94
Ukraine	2+	3+	4	1	5,680	16.0	0.63	0.83
Uzbekistan	3-	3	-4	1	2,740	14.3	0.47	0.83

Notes: Privatization indexes from EBRD (1999), initial conditions from de Melo et al. (2001), CIT tax share from Mitra and Stern (2003), effective/statutory taxation from Schaffer and Turley (2002), and revenue reporting calculated from BEEPS data. See text for definitions. NA, not available. Countries listed are those in the BEEPS, less Turkey, Bosnia, and the Serb Republic in Bosnia.

objective function in expression (3). The nature of the crisis was twofold: on the one hand, postcommunist countries inherited levels of expenditure that could be reduced only at significant political cost; on the other, the state lost its ability to extract revenue through the traditional mechanism of transferring funds from state-enterprise accounts. Faced with crumbling infrastructure, wage arrears and demands from various interest groups for subsidies and transfers, the desire to increase tax revenue has been a first-order concern for most postcommunist politicians.¹⁰

At the same time, the shock to resource allocation provided by privatization was, from the perspective of the *de novo* sector, not overwhelming. “Small” privatization – the transfer of real estate, shops, and other assets that could be used to start new firms – was significant and, as Table 1 shows, across the postcommunist world was generally carried out more completely than was large privatization.¹¹ Nonetheless, small privatization involved a relatively small proportion of total assets in the economy, so the share of resources in the “new” sector, i.e. L_N , was not overwhelming.

In looking to explain different outcomes, we must therefore examine whether there were differences in the “resistance” of the old equilibrium in response to these moderate shocks to resource allocation. Condition (1) says that any such differences are due either to the size of the shock itself, the relative efficiency of the old vs. the new sector (α_O/α_N), or to the ability of the state to tax the two sectors (τ_O/τ_N). With respect to the first point, the EBRD privatization indexes reported in Table 1 summarize the fact that the scale of small privatization was on average a bit higher in Eastern Europe than in the former Soviet Union. The difference, however, is small. Substantial differences in (α_O/α_N) can probably be dismissed on theoretical grounds: given the massive misallocation of resources in communist economies, the inherent productivity of new enterprises was likely quite large relative to that of most of the old state sector across the postcommunist world. Finally, as I will discuss in detail, there were sizable differences in (τ_O/τ_N), the result of postcommunist states’ experience in the early 1990s in building new revenue systems.

Taxation under communism was largely an accounting matter, with state-enterprise funds transferred from one account to another within the state “monobank” (Kornai, 1992, ch. 8). The collapse of communism and liberalization of economic activity left state finances a shambles throughout the postcommunist world, and state officials were forced to scramble to assemble systems capable of taxing market activity (Ebrill and Havrylyshyn, 1999; Hemming et al., 1995; IMF, 1998). Roughly speaking, two different systems emerged. In Eastern Europe and the Baltics, states went about the difficult task of learning to tax individuals, so that income and payroll taxes

¹⁰See e.g. Akhmedov and Zhuravskaya (2004) on the importance of public expenditures in determining regional electoral outcomes in Russia.

¹¹On small privatization in Eastern Europe, see Earle et al. (1994).

together accounted for a substantial portion of total tax revenue. In contrast, in the former Soviet Union less the Baltics there was a greater emphasis on taxing business activity, especially through corporate income taxes (CITs). Data on the composition of tax revenue in postcommunist countries (see Mitra and Stern, 2003) tell the story: in 1999–2000, 12 of the 13 postcommunist countries collecting more than 40% of total tax revenue in individual and payroll taxes were in Eastern Europe and the Baltics, whereas seven of the eight postcommunist countries where profit tax made up more than 10% of total tax revenue were in the CIS.¹²

Two explanations for this outcome have been suggested. First, it is possible that the industrial structure of states in the CIS was different than that in Eastern Europe and the Baltics in ways that were important for taxation (Easter, 2002). Much has been written about monoindustrial towns in the former Soviet Union (Andrienko and Guriev, 2002; Expert Institute, 2000) and the extreme bias against small enterprises in the size distribution of Soviet firms (Brown et al., 1994), and although little comparative data exist for Eastern Europe and the Baltics, it seems plausible that the legacy of seven decades of Soviet planning favored concentrating on a few key enterprises rather than relying on a policy of more general taxation. Similarly, the greater availability of natural resources in the CIS may have discouraged state officials from investing in the capacity to tax less easily available sources of revenue. Second, it may be that the greater proximity of Eastern Europe and the Baltics to the European Union encouraged states in that region to harmonize their revenue systems with those of the EU (with their lesser emphasis on taxation of corporations), either for reasons of trade and investment or because of the requirements of EU accession (Appel, Forthcoming).

The regression results reported in Table 2 provide some evidence for both explanations. I regress the proportion of all tax revenue collected as CIT in 1999–2000 on several proxies for these initial conditions. Data for the initial-conditions variables are taken from de Melo et al. (2001), and are given in Table 1. To capture the industrial-structure argument I use both a measure of overindustrialization, which is defined as the difference between the percentage of industry in gross domestic product (GDP) and that predicted given the country's level of economic development (countries that are overindustrialized may have relatively more Soviet-era enterprises), and a trichotomous measure of the country's natural-resource wealth. The incentive effect of potential trade and investment with, and entry into, the European Union is measured with a dummy variable for whether or not the country is in the CIS (because physical proximity to the EU is important) and (log) GDP per capita in 1990 (as wealthier countries are more likely to

¹²Seven of the eight countries where CIT contributed more than 10% of total tax revenue are listed in Table 1. The eighth – Turkmenistan – is excluded because firms in that country were not surveyed in the BEEPS, described below.

TABLE 2 TAX STRUCTURE AND INITIAL CONDITIONS

	Estimated coefficient	Standard error
Overindustrialization	0.17*	0.10
Natural resources	2.55*	1.23
Log GNP per capita, 1989	-0.47	1.64
CIS	5.46***	1.69
Constant	8.19	13.97
<i>N</i>		22
<i>R</i> ²		0.61

Notes: OLS regression. Dependent variable is corporate income tax revenue as a percentage of all tax revenue in 1999–2000.

Significance levels: *** $p = 0.01$; * $p = 0.10$.

be accepted as EU members). Obviously, these proxies for initial conditions are imperfect, and in interpreting regression results one should consider the possibility that the CIS dummy is picking up not only any effect of geographic location but also unmeasured variation in other initial conditions. In particular, it is possible that the overindustrialization measure does not fully capture the variation in the size and geographic distribution of firms emphasized in the literature: as can be seen in Table 1, according to this measure countries in the CIS are on average *less* overindustrialized than those in Eastern Europe and the Baltics, though there is substantial variation within both regions.

The estimated coefficients on all the initial-condition variables but log GNP are statistically significant from zero, all estimated coefficients have the expected sign and the effects are substantively large. Controlling for other characteristics, CIT makes up a larger proportion of total tax revenue for countries that are overindustrialized and rich in natural resources, and a smaller proportion for countries that are located close to the EU, and thus are more likely to become members of the EU and to trade with the West. The four proxies for initial conditions together account for 61% of total variation in CIT collection.

An important element of this difference in tax strategy is that some countries concentrated much more than others on *compliance* with corporate income taxation. Table 1 reports estimates of the ratio of effective to statutory taxation in 20 postcommunist countries from Schaffer and Turley (2002). This measure, calculated as the ratio of the effective tax rate (CIT collected as a proportion of total income from capital) to the statutory (corporate income) tax rate, varies substantially across postcommunist countries. It is especially high in several countries in the CIS that have invested considerably in collecting business taxes: Belarus (0.39), Russia (0.33), Ukraine (0.63), and Uzbekistan (0.47); for purposes of comparison, the 1996 average for the EU is 0.24. Variation in these tax-administration activities

appears to account for much of the variation noted above in the importance of corporate income taxation: the pairwise correlation between the effective/statutory tax ratio and CIT as a percentage of all taxes is 0.60, whereas that between the effective/statutory tax ratio and the percentage of GDP collected as CIT is 0.74.

To the extent that tax authorities concentrated at all on corporate income taxation, however, effort was not allocated equally among all types of firms. As Tanzi (2001) notes, many postcommunist countries facing fiscal crisis set up “large-taxpayer units” to focus tax collection on a few key enterprises, and in general it appears that tax enforcement was directed more at larger (i.e. older) than smaller (i.e. newer) enterprises, especially so in countries focused in general on collecting profit taxes. As discussed above, some of the same factors that led countries to emphasize corporate taxation in general – an industrial structure organized around large firms and relatively easy-to-tax resource companies – may have encouraged tax authorities to concentrate on taxing old rather than new firms. At the same time, it is possible that old firms are comparatively easy to tax throughout the postcommunist world, but that from the perspective of tax authorities the gains from exploiting this particular revenue source are smaller where the tax system has been built around taxation of individuals rather than companies.

Evidence for the particular reliance on revenues from old enterprises among countries where business taxation is especially important comes from a survey of enterprises carried out in 1999 by the World Bank and EBRD (the Business Environment and Enterprise Performance Survey, or BEEPS) in the 23 postcommunist countries listed in Table 1.¹³ Firms in the survey, of which slightly more than half are *de novo* enterprises, were asked, “What percentage of the sales of a typical firm in your area of activity would you estimate is reported to the tax authorities, bearing in mind difficulties in complying with taxes and other regulations?” Wording such as “a typical firm in your area of activity” is common for sensitive questions like this one, and one typically assumes that respondents answer based on their personal experience.¹⁴ For each country I calculate the average proportion of revenues hidden by new and old firms, and then construct a ratio of these two averages. Assuming that profit-maximizing firms hide revenue to the extent that they can get away with it, a value for this ratio of less than 1 indicates

¹³The survey also included firms in Turkey, Bosnia, and the Serb Republic in Bosnia. I do not include firms in Turkey because it is not a postcommunist country, nor firms in Bosnia and the Serb Republic in Bosnia because the long war in those entities makes comparison with other postcommunist countries difficult.

¹⁴As evidence of the validity of this measure, the pairwise correlation between the average proportion of revenues reported by firms within a country and the percentage of GDP collected as taxes in 1999–2000 is 0.52. Furthermore, as Gehlbach (2006) demonstrates, within-country variation is systematic, with firms in sectors that are presumably harder to tax saying that a “typical firm in [their] area of activity” does in fact report less of its sales to tax authorities.

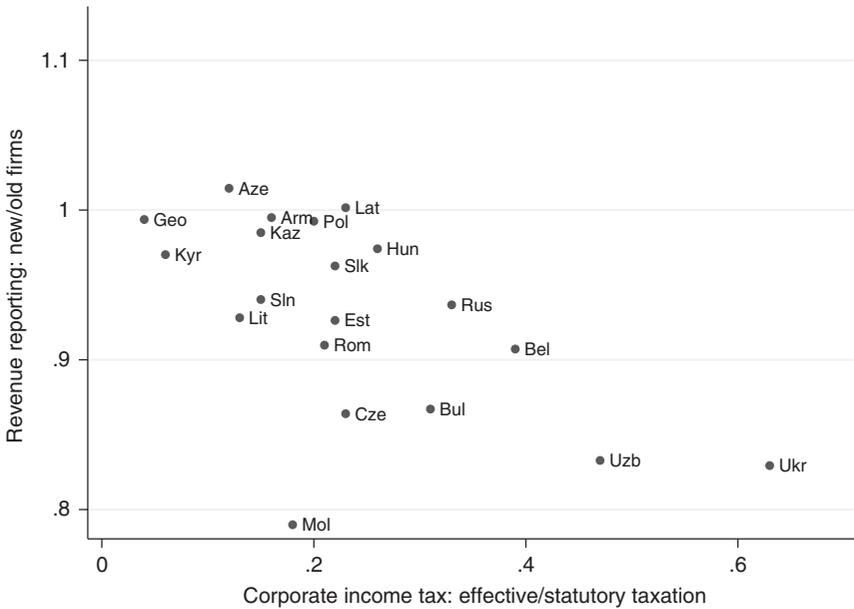


Figure 2. Tax administration and revenue reporting in new vs. old firms.

that old firms find it comparatively difficult (relative to new firms) to escape the attention of tax authorities.

Figure 2 plots the ratio of revenue hiding among new to old firms against the ratio of effective to statutory taxation reported above. As can be seen, there is a clear negative relationship between *relatively* poor tax compliance among de novo enterprises on the one hand and a general focus of tax-administration effort on corporate taxation on the other. New and old firms differ little in the degree to which they report revenues to tax authorities in countries collecting almost no CIT, but the difference is substantial – in several cases in excess of 10% – in countries where the effective/statutory tax ratio is large.¹⁵ Put differently, countries that have successfully focused on increasing CIT revenue appear to have done so by especially concentrating their energies on extracting revenues from old enterprises.

As might be expected from the general pattern of revenue extraction within the postcommunist world, the ratio of revenue reporting among new to old firms is thus lower in the CIS (an unweighted average of 0.93) than in Eastern Europe and the Baltics (0.96). However, within these two regions there is substantial variation, which sheds further light on the tax strategies of postcommunist countries. For example, the late-industrializing countries of Bulgaria and Romania report larger differences in the taxability of new vs.

¹⁵A similar pattern is observed if the estimates of CIT “normalized tax yield” in Schaffer and Turley (2002) are used instead of the effective/statutory tax ratio.

old enterprises than is typical within Eastern Europe, as does the Czech Republic, which was industrialized before communism but was especially overindustrialized during the communist era. Furthermore, within the CIS, new and old firms in the Caucasus and Central Asia report little difference in tax compliance, but this appears to be more the failure of authorities to collect taxes from *any* entities than a particular decision to focus less on large enterprises. (Together with Albania, the countries of the Caucasus and Central Asia included in Figure 2 – Georgia, Armenia, Azerbaijan, Kazakhstan and Kyrgyzstan – had by far the lowest proportions of GDP collected as tax revenue in 1999–2000 of any of the postcommunist countries listed in Table 1; see Mitra and Stern, 2003.) Given the share of tax revenue derived from CIT, these countries are all “underperformers” from the point of view of actually collecting corporate taxes. Consequently, it seems possible that as tax administration improves in these countries they, too, will focus more on old rather than new firms.

Thus, not only was corporate income taxation especially important in the countries of the CIS, but business taxation in many of these countries was particularly skewed toward collecting taxes from old rather than new firms. In terms of the model presented in the previous section, (τ_O/τ_N) may therefore have been larger in the eastern half of the postcommunist world than the western half. As a consequence, the potential revenue importance of *de novo* firms was comparatively small in the eastern half of the postcommunist world, thus reducing the likelihood that the shock of privatization would be sufficient to push rank-and-file policy-makers into shifting their support from the “old” to the “new” sector.¹⁶ (Alternatively, as in section 2.4, it is possible that the “new” equilibrium did not even exist in countries where it was especially difficult to tax new private economic activity.) In Russia, Prime Minister Viktor Chernomyrdin famously declared that Russia would not become a “nation of shopkeepers.” He need not have worried. Throughout the country local officials, desperate for revenue and endowed with scarce resources that they could expend promoting either

¹⁶Among the countries for which small-employment data are illustrated in Figure 1, two cases stand out as inconsistent with this general argument. As shown in Table 1, the Czech Republic in 1999 was (by East European standards) quite reliant on CIT, and had a small (by any standard) ratio of revenue reporting by new to old firms. Thus, one might have predicted that the Czech Republic would remain mired in the “old” equilibrium rather than transition to the “new.” Although it is possible that the difference was the especially far-reaching nature of small privatization in that country, the more likely explanation for why, despite a low τ_O/τ_N , the Czech Republic shifted to the “new” equilibrium is the attractiveness of Prague as a tourist destination and the large service industry which it spawned: in terms of the model, α_N/α_O may have been larger in the Czech Republic than elsewhere. Second, Kazakhstan has a quite high ratio of revenue reporting by new to old firms, which together with extensive small privatization might have favored a transition to the “new” equilibrium. However, the data on revenue reporting (from the BEEPS, which surveyed only firms with 1,000 employees or fewer) likely mask the enormous importance of the resource sector in Kazakhstan, which (as elsewhere) is especially easy to tax.

old or new economic activity, largely chose the path well traveled. The logic was expressed clearly if not uniquely by the economic advisor to the governor of Pskov oblast, a region not far from St. Petersburg: "One working factory will provide more tax revenue than all small enterprises taken together."¹⁷ Privatization had been insufficient to change the mind of this and similar officials across the post-Soviet world. Labor and capital remained mired in old and relatively unproductive enterprises, the result of decisions made early in the 1990s, as how best to plug the fiscal gap.

4. CONCLUSION

This paper offers a new explanation for "productivity traps," one in which the government is more culprit than solution. When factors of production are mobile across sectors and politicians care about tax revenue, both factor owners and policy-makers may find themselves mutually dependent on the status quo. Coordinated action could in principle lead to a different political economy organized around more productive economic activity. In the absence of such coordination, however, whether such a shift takes place may depend on the resistance of the political economy to an exogenous shock to resource allocation, such as might be caused by a war or natural disaster.

I argue in the context of the postcommunist transition that such a shock was in fact consciously implemented by individuals other than the political actors dependent on the status quo. Taking advantage of a brief "window of opportunity" to push through radical reform, these policy-makers undertook mass privatization to try to force the hand of future generations of politicians. In places it worked. But in large parts of the post-Soviet world there was no shift to a truly "new" equilibrium organized around *de novo* economic activity, a failure which I suggest is due to the particular revenue importance of state-owned and formerly state-owned enterprises in that region. This importance grew out of choices made by postcommunist governments in the early 1990s as they created tax systems capable of taxing market activity. They were choices with far-reaching consequences.

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¹⁷*Pskovskaya Pravda*, April 23rd, 1997. As discussed in Gehlbach (2006), the oblast government proceeded to create that one factory, carving a vodka sector out of pre-existing assets in the local food-processing industry.

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