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Taxes and Government Incentives: Eastern Europe vs. China

by Roger H. Gordon and David D. Li

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by

Roger H. Gordon
and
David Li
University of Michigan

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Abstract. Local officials in China have strongly supported new nonstate firms, yet other officials in transition countries have often strongly hindered them. We argue that a likely cause of these sharp differences in behavior is differences in the source of government revenue. Local revenue in China came from profits and other taxes on new entrants, while elsewhere in transition countries tax revenue came disproportionately from the old state enterprises. All these officials can easily draw on public funds for personal use. As a result, local Chinese officials have a personal interest in encouraging the development of new firms, while other officials have a financial interest in suppressing new firms. To induce officials to be supportive of new firms, the model suggests raising the effective tax rate on these firms. Surprisingly, past work has ignored the role of the tax system in influencing the incentives faced by government officials.

Keywords. Transition Economies, Government Incentives, Principal–Agent Models, Taxes and Economic Behavior

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Address. Department of Economics, University of Michigan, Ann Arbor, MI 48109-1220. Telephone: Gordon: 1-313-764-6769; Li: 1-313-763-9561. Email: Gordon: rgordon@umich.edu; Li: davidli@umich.edu.

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Roger H. Gordon
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David Li

The countries in Eastern Europe and those from the former Soviet Union initially hoped to make a quick transition to a prosperous market economy by immediately adopting Western–style legal and regulatory systems and by quickly privatizing existing state firms and state banks. Given the extraordinarily inefficient allocation of resources under central planning, with for example a massive overinvestment in heavy industry, underinvestment in wholesale and retail trade and in services, and the use of very antiquated technologies, a rapid jump in productivity through the reallocation of resources and the import of more up–to–date equipment certainly seemed likely. Yet, the outcome was not consistent with this optimistic expectation. Outputs fell by 20% or more during the first year or two of the transition, and since then have at best been growing slowly (at least by East Asian standards). The unexpectedly poor economic performance has even led to the return to power in some of these countries of political parties closely affiliated with the old Communist parties, suggesting popular discontent with the outcome to date of the economic reforms.

There is no shortage of possible explanations for this rocky transition. A successful transition requires the rapid entry and growth of new firms, layoffs of employees from inefficient existing state firms who would then move into these new firms, and ultimately the bankruptcy and closure of many of these inefficient firms. Yet existing market institutions do not handle these types of activities well. New firms have been severely credit rationed.[1]

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[1] According to Johnson and Loveman (1995), new firms received little or no bank credit, had initial capital stocks of under $1,000, and as a result tended to concentrate in industries requiring little capital. de Melo, Ofer, and Sandler (1993) note a similar lack of credit to private firms in Russia.

Households have also been severely credit rationed, making it difficult for them to cover the search costs of looking for a new job. A market for housing has been very slow to develop, making it difficult for individuals to change location. Information spillovers may inhibit entry, the incentives on existing firms to lay workers off or shut down may be too great, etc.

At least part of the explanation for the slow and rocky transition, however, has been the unsupportive and at times obstructive role of many levels of government.[2] While top political leaders can push for a very rapid transition, the many employees at state ministries, at state banks, and in local governments, must also support the reforms if they are to be implemented successfully. Yet these officials have in practice severely rationed credit to new firms, made their access to land and office space extremely difficult, and interfered in many other ways in an apparent attempt to support state firms and limit the competition they face from private firms. At the same time, state banks continued to provide generous credits to ailing state–owned firms, in spite of the low probability of repayment.

To some degree this obstructive role of mid–level and local officials was only to be expected, given their long-standing ideological opposition to private sector activity and the close personal links between these officials and managers in the old state firms. However, this explanation is not in itself sufficient. Chinese government employees had the same past links with state firms, and operated under an ideology at least as strongly opposed to any hints of a market economy. While the national government in China behaves in ways quite consistent with the behavior observed in Eastern Europe, Chinese local governments have been the key engine of economic growth during the reform period. The enterprises set up under their control have grown from under 10% of national nonagricultural output in 1980 to over 30% in 1992, in spite of various attempts by the national government to limit the allocation of resources to these firms.[3] These firms are among the most efficient and dynamic in the Chinese economy. The economic reforms have also generated strong

[2] Based on survey evidence, for example, Shleifer (1996) documents that local governments in Poland have been unsupportive of new firms while those in Russia have actively obstructed new firms.

[3] See Jefferson and Rawski (1984) for further discussion.

political support at the local level. The attempts, for example, by the national government to reimpose many elements of centralized allocation after the Tienanmen massacre in 1989 had to be abandoned quickly, in good part because of the strong opposition from local political officials and from the population more generally.

Why have at least local government officials in China behaved so differently than officials elsewhere? Qian and Xu (1993) argue that local governments in China have always been more autonomous than equivalent governments in Poland and the Soviet Union, making it easier for them to pursue local interests. The unanswered question is why local governments in China aid new nonstate firms while local governments elsewhere instead protected the local state firms. Alternatively, Sachs and Woo (1994) argue that the differences in government behavior simply reflect the greater opportunities available in China for profitable entry, due to the poorer initial conditions in China. In all of these economies, however, the service sector, transportation, and light manufacturing had all been heavily neglected previously, and these are the industries where entry in China has concentrated.

Our hypothesis is that the contrasting behavior of government officials in these countries can be explained by differences in their source of tax revenue. We presume that officials in any of these countries can easily benefit personally from the tax revenue in their jurisdiction, giving them a financial interest to choose policies that increase their tax base. The tax revenue for local governments in China during the transition came almost entirely from the profits of new nonstate firms set up in their jurisdiction.[4] As a result, these officials had a strong financial interest in increasing the profitability of these new firms.[5] Since individuals were readily mobile across jurisdictions, profits could be increased only by finding new profitable activities and increasing the efficiency of old activities, rather than by squeezing yet more income out of local residents. The control local officials had over the allocation of land, bank loans, and the appointment of the managers of local firms, gave them ample means to pursue these objectives.

[4] Officials also had the power to influence the use of whatever profits remained after tax, often for example taking a good fraction of it in the form of various fees. Their ability to extract yet further income through under–the–table payments (*guangxi*) only strengthened the link between their income and the profitability of the local economy.

[5] See Oi (forthcoming) for a similar explanation for the behavior of Chinese local governments.

The revenue of the national government in China, in contrast, came primarily from taxes on state–owned firms. The differing tax bases of local vs. national governments in China inevitably lead to differing political objectives. The allocation of resources between state and nonstate firms was as a result largely determined by the allocation of tax revenue between national and local governments.

In Eastern Europe, officials in practice could also benefit personally from the revenue available to the government. The revenue of both local and national governments at least initially continued to be heavily dependent on the performance of the old state–owned firms — little or no government revenue came from newly created private firms. In Poland, for example, only 5.8% of total government tax revenue came from taxes on private firms as of 1990.[6] Officials' inability to monitor the profits of private firms forced governments at least initially to confine their taxation of private firms primarily to site licenses. These license fees were in fact very low, since the private firms included poor farmers selling limited amounts of produce as well as highly profitable enterprises engaged in large scale international trade.

Since Eastern European governments have shared at the margin in the profits of state firms but not in those of private firms, their economic incentive has been to adopt policies that aid state firms at the expense of private firms. In fact, they appear to have responded actively and creatively to these financial incentives, and had amply means at their disposal to do so. Governments still for the most part control the allocation of land, so can control the allocation of office or factory space to private vs. state firms. In addition, the lending behavior of banks can be heavily influenced by the preferences of government officials, affecting the access of private vs. state firms to bank credit. A variety of other commodities, e.g. electricity, continue to be traded at nonmarket–clearing prices, allowing officials to limit the access of private firms to these commodities. Government officials need to approve joint ventures with foreign firms, and again can shift foreign investments towards state and away from private firms.

[6] This figure includes revenue not only from new entrants but also from formerly state–owned firms that had been privatized. For these latter firms, the state would have better sources of information and so have a better chance of collecting some tax revenue, but the quality of information will inevitably deteriorate over time due to the loss of control.

In section 1, we develop more formally the intuition that the incentives faced by government officials are determined by the source of their tax revenue, as well as by any ideological preferences and by possible bribes from certain industries. The differences in the source of tax revenue in China vs. Eastern Europe provides a possible explanation for the differences in behavior of public officials in the two regions.

Of course, elected government officials in Eastern Europe (though not government bureaucrats) face the prospect of being voted out of office if their performance is unpopular, pressures that do not exist to date in China. One competing story for the differing behavior of Chinese vs. Eastern European officials is that the pressure from periodic elections forces a slower reform process in Eastern Europe.[7] The recent election in several Eastern European countries of officials linked with the former Communist parties suggests that pressures from voters may be partly responsible for the limited allocation of resources to the private sector. Policies favored by the median voter certainly can differ from efficient economic policies, as emphasized by Buchanan and Tulloch (1962). Voters may even misperceive the full implications of their votes, and mistakenly favor policies that in fact lower their welfare.

In section 2, we add voting as a further means to influence the incentives faced by public officials. We show that even if voters are fully informed and even if their objective in voting is to maximize economic efficiency, the fact that any officials they elect will face strong financial incentives from bribes and from their source of tax revenue severely limits voters' ability to induce officials to choose the policies voters prefer. Certainly, in this second best setting, the ideology of the elected officials can differ from those of the electorate. Since officials in Eastern Europe, regardless of party, have provided few resources to the private sector, we hypothesize that the key political issue is the allocation of resources among the old state firms rather than between state firms and the newly emerging private sector. In this context, we show that informed voters that prefer efficient policies may still rationally choose to elect officials whose ideology makes them strongly supportive of state–owned

[7] See, for example, Kornai (1997) or Dewatripont and Roland (1992) for arguments that reforms must proceed slowly so that at each point gainers outnumber losers. Similarly, Berkovitz (1995) and Gordon and Li (1997) argue that democratic pressures may lead to more redistribution, introducing tax distortions that discourage new investment.

firms. The fact that voters in Eastern Europe have at times elected officials who support allocating resources primarily to the state–owned firms does not necessarily imply therefore that the existence of elections in Eastern Europe but not in China is responsible for the resulting inefficient allocations. Our hypothesis instead is that the more distorted financial incentives faced by officials in Eastern Europe is responsible for both the poorer allocation of resources and the observed behavior of voters there.

Tax systems have evolved during the reform process. In section 3, we discuss briefly how we expect government behavior to change as governments develop improved means to monitor and tax private firms, and as broader-based taxes such as a value–added tax and payroll taxes replace profits taxes as the main source of tax revenue. Regardless of the nature of the tax used, this model suggests that one way to improve the performance of the private sector in these countries is to raise the effective tax rate on this sector to a level comparable to or even higher than that faced by state–owned firms, in order to provide incentives to public officials to allocate resources to private firms.

Section 4 provides a brief set of conclusions.

1. Government behavior in Eastern Europe

Behavior ignoring electoral pressures

Our initial aim in modeling government behavior in Eastern Europe is to examine to what degree the slow and rocky transition process there can plausibly be explained by the poorly designed incentives faced by government officials in these countries, and to see if this model also explains the smoother transition observed in China. We postpone until the next section the impact of elections on the incentives faced by officials; this section examines the effects of other incentives faced by officials on their allocation decisions.

We assume that these officials control the allocation of some input(s) I to the various firms in the economy.[8] The economy consists of a sector of nonstate firms and S different

[8] During at least the early stages of the transition process, government officials continued to exercise substantial control over the allocations of land, bank loans, and in some countries even capital investment, skilled workers, energy, and foreign exchange.

industries within the state sector. The amount of inputs allocated to nonstate firms is denoted by I_n and the amount allocated to industry s in the state sector is I_s, where $I = I_n + \sum_s I_s$. The resulting profits in industry s in the state sector equal $\pi_s(I_s)$, while nonstate profits are denoted by $\pi_n(I_n)$.

What factors influence the allocation decisions of government officials? If we were examining the factors affecting allocation decisions by corporate managers, we would immediately focus on the links between their pay and performance and any effects of their performance on their chances for promotion or demotion, due to decisions by the Board of Directors or due to hostile takeovers.

The situation of government officials is very different, however. To begin with, the salaries of government officials are rarely linked to any measure of their performance, and at least civil servants face essentially no threat of losing their jobs and rather mechanical rules for promotion. For purposes of generality, we assume that the present value of their salary equals $\sigma + \sum_s \sigma_s \pi_s + \sigma_n \pi_n$, but will normally assume that σ_s and σ_n are both very small, and for simplicity will assume that the σ_s are all equal.

Unlike corporate managers, however, government officials may well have important ideological beliefs that affect their allocation decisions. Based on their ideological preferences alone, we assume that these officials would maximize some function $\sum_s \alpha_s \pi_s + \alpha_n \pi_n$, where α_s (α_n) measures the amount of personal income that the officials currently in office would be willing to give up in order to raise profits of state (private) firms by a dollar, where for simplicity we assume that the α_s are all equal. Reformers would presumably be characterized by $\alpha_n \geq \alpha_s$ and may even have $\alpha_s < 0$, whereas the parties derived from the former Communist parties would certainly have a much smaller relative value of α_n and plausibly a larger absolute value of α_s — they would have less aversion and probably a clear preference to allocate resources to state–owned firms.

Government officials can also benefit in various ways from the size of the budget over which they have control.[9] In particular, extra tax revenue gives them access to various noncash benefits, whether in the form of fancier offices, a nicer company car or apartment,

[9] Niskanen (1971) was probably the most influential paper developing this idea.

more travel and banquets, or the employment of more relatives. For simplicity, we assume that the amount of nontax benefits they can extract from the government is proportional to the amount of tax revenue collected.

At the beginning of the reform process in both Eastern Europe and China, profits taxes, payroll taxes, and selective excise taxes (e.g. on alcohol) were dominant sources of tax revenue. More recently, several of these countries have shifted to relying heavily on value–added taxes. We will focus initially on the incentive effects of profits taxes, and postpone to section 3 the discussion of the implications of payroll, excise, and value–added taxes.

Under profits taxes, tax revenue equals $\sum_s t_s \pi_s + t_n \pi_n$, where t_s equals the effective profits tax rate in state sector s (for simplicity assumed to be the same for all industries) and t_n the effective rate on nonstate profits. The officials are then assumed to be able to keep for themselves the fraction γ of this tax revenue.

In addition, in spite of any law to the contrary, officials are likely to receive bribes from various special interests in exchange for changes in their allocation decisions. The initial model of bribery and government behavior by Krueger (1974) has spawned a huge literature attempting to explain the prevalence of tariffs. Bribery in practice seems to be playing a far more important role in China and Eastern Europe than it does in the U.S. and Western Europe, in part perhaps because governments in transition economies control far more than relative tariff rates and detailed aspects of the tax code. We therefore have chosen to model explicitly how bribery will likely affect allocation decisions in transition economies.

Bribes in Eastern Europe (or China) can occur for a variety of reasons. To begin with, individual firms may need to make under–the–table payments to gain access to goods that are not traded at market–clearing prices, or where explicit government approval is required to gain access.[10] However important this source of bribery may be, we do not include it explicitly in the model since it yields the same allocation that would occur if prices

[10] Shleifer and Vishny (1992) argue that officials set prices below a market–clearing level because they value the under–the–table payments more than the on–the–table payments — it is easier to keep more of the former payments for personal use.

were market clearing. In particular, all firms are in a symmetric position when making supplementary payments, resulting in an implicit market price composed of the official price plus an equilibrium supplementary payment. Instead we focus on organized bribery that needs to be undertaken at the industry level in order to induce officials to approve policies whose benefits are shared among all firms in the industry.[11] Industries need to find some mechanism to overcome the free–rider problem within the industry in order to effectively make such bribes. Such cooperation would be very difficult within the nonstate sector, given the large number of small firms in this sector, their recent entry and rapid turnover, and the diverse products they produce. In contrast, production within the state sector in a given industry is normally concentrated among very few extremely large firms. Presumably this structure was chosen in the past to facilitate communication between the planning ministry and the industry. The cooperative relationship that developed within the industry under central planning would now make continuing cooperation readily feasible when attempting to influence current government behavior.

We will therefore assume that all of the industries in the state sector can potentially collude to bribe government officials. However, we will also assume that accepting bribes and altering policy to favor special interests carries with it some risks of detection and punishment. In particular, if the officials accept bribes of B_s from some industry s, then the net amount B_{ns} they get from that industry equals $B_{ns} = \delta B_s - C$ with $0 < \delta < 1$ and $C > 0$. Intuitively, the probability of detection depends on the presence as well as the size of the bribes, where the parameters C and δ capture the combined effects of the probability of detection and the size of the resulting fine. Given these fines faced by officials who accept bribes, some industries will not have enough at stake to benefit from paying a bribe. In particular, a bribe must at least equal C/δ for an official to consider accepting it, yet the potential benefits to the industry of the bribe may not be this large. As a result only some of the industries will end up paying bribes. If industry s does pay bribes, let $d_s = 1$ and otherwise set $d_s = 0$. Without loss of generality, we assume that S^* state–owned industries pay bribes.

[11] Our model is closely parallel to the political–economy model of tariff formation in Grossman and Helpman (1994).

In addition, we assume that the bribes are structured optimally from the perspective of the bribing industry and that each industry can make a take–it–or–leave it offer to the public official. This implies that the official fully takes into account the dollar impact of his allocation decisions on the bribing industries and that the level of the bribes are set so that the official is just indifferent to accepting each bribe, given the existence of all the other bribes.[12] This implies that bribery leads officials to act in the joint interests of the bribing industries and themselves, adding to the objective function of officials an amount equal to $\delta \sum_s d_s(\pi_s(1-t_s) - X_s) - S^*C$, where X_s equals the lump–sum deduction made by industry s to assure that its bribery leaves the overall utility of officials unchanged, given the behavior of other industries.

One possible use of bribes, for example, is to assure successful evasion of profits tax payments. This has been a major issue in Russia and some other former Soviet Republics. Such tax evasion would not pay as long as officials gain more from receiving the revenue in the form of tax payments than in the form of bribes, i.e. as long as $\gamma t_s \pi_s > \delta t_s \pi_s$ among firms that would be bribing in any case. We will assume for purposes of discussion that this equation holds, so ignore in most of the discussion the prevalence of tax evasion in several of these countries.

Combining the various financial and ideological factors affecting the incentives of government officials, they should act so as to maximize the following objective function:

$$W \equiv \max_{I_i} \left[\sum_{s=1}^{S} (w_s + d_s\delta(1-t_s))\pi_s(I_s) + w_n\pi_n(I_n) + \sigma - CS^* - \sum_{s=1}^{S} d_s\delta X_s \right], \quad (1)$$

where $w_s = \alpha_s + \sigma_s + \gamma t_s$ for $s = 1, \ldots, S$ and $w_n = \alpha_n + \sigma_n + \gamma t_n$. Here, each X_s is set so that the industry's bribe leaves the utility of public officials unaffected, implying that the value of equation (1) remains unchanged if $d_s = 0$ and the official then reoptimizes over allocation decisions. Officials maximize equation (1) with respect to their allocation decisions, taking the δ_s and X_s as given.

While officials allocate resources to maximize equation (1), efficiency in contrast would require that resources be allocated to maximize $\sum_s \pi_s(I_s) + \pi_n(I_n)$, implying equal weights

[12] We ignore, therefore, any possible losses from bargaining between industries and officials in the presence of asymmetric information.

on each of the profit terms. The variation in the weights on the various profit terms in equation (1) therefore captures the sources of inefficiency in the resulting allocation of factors chosen by these government officials.

In Eastern Europe, the initial governments after the reforms started certainly announced a strong preference to shift resources into nonstate activities through both rapid privatization and support for new entry, suggesting that $\alpha_s << \alpha_n$. Any links between wage compensation and performance we assume were small. Also, in the presence of the free press that developed under the reforms, we presume that the risks faced by officials who inexplicably favored one industry over another were important, so that δ was relatively small and C large. As a result, presumably relatively few industries could afford to pay sufficiently large bribes in order to get special treatment. Yet, while all of these factors suggest that resources would go primarily to the private sector and the few state industries that do engage in bribery, resources in practice continued to be allocated broadly to existing state–owned firms, with very little going to the private sector. The key factor within the model that can explain this is the role of tax revenue. Given the enormous difficulties the government had in monitoring the profits of private firms, in practice $t_n \approx 0$ whereas t_s was quite large. We therefore infer, given the model, that the financial incentives arising from the dependence of tax revenue on the profits of state–owned firms has played a dominant role in determining government behavior.

Local governments in China probably had some ideological preference favoring state–owned firms, though the horrors of the Cultural Revolution likely dampened substantially any such ideological preferences. In contrast to the governments in Eastern Europe, however, their tax revenue came almost entirely from nonstate firms. Under the reforms, local governments could keep essentially all the tax revenue collected from the firms that they helped set up. Only a prenegotiated lump–sum had to be passed along from local to higher levels of government. Not only did local governments receive income tax revenue from the firms they set up but in addition they were in a position to impose a wide variety of supplementary fees, purportedly to finance various local public services. While some funds were left within the firm, the amount retained was effectively chosen by local governments in order to provide appropriate incentives to firm managers and workers and to finance desired

investment projects. Therefore, $t_n \approx 1$, giving Chinese local officials a strong incentive to allocate resources to new private firms. Local governments undoubtedly receive bribes from state–owned firms — corruption seems to have been rampant in China.[13] Plausibly, δ was large enough, and C small enough, that $S^* \approx S$. Under these assumptions, local governments would still favor nonstate firms, but allocate some resources to state firms and allocate these resources relatively efficiently within the state sector given that almost all industries would find it attractive to pay bribes.

Why were the Chinese able to collect income tax revenue from nonstate firms while Eastern European governments could not? The Chinese nonstate firms were not truly private. Their managers were normally appointed by the local governments, and the local governments faced no binding legal restrictions limiting their ability to extract funds from these firms. Therefore, the government's ability to collect revenue from these firms, and the resulting incentive faced by the government to allocate resources to these firms, arises from the partial nature of the Chinese reforms. The township and village enterprises seem to be sufficiently private to behave relatively efficiently and to respond quickly to changing incentives, but not so free from oversight that they can escape taxation. As in Eastern Europe, the Chinese have found it difficult to tax truly private firms, and the truly private sector has remained small to date in China.

The Chinese national government, in contrast, received the vast bulk of its tax revenue from state–owned firms.[14] Given this financial incentive in addition to an ideological preference to favor the state sector and a lax atmosphere allowing wide–spread bribery, the national government would be forecast to ignore the private sector almost entirely, but to allocate resources fairly efficiently within the state sector.

Given these differing incentives faced by the national vs. local governments in China, our model forecasts that the allocation of resources to state vs. nonstate firms would largely depend on the allocation of tax revenue between the national and the local governments. For example, increasing the size of the lump–sum payments to the national from

[13] While there were occasional political campaigns that attacked corruption, these campaigns proved to be brief and largely symbolic.

[14] Revenue transferred to the national government from local governments took the form of lump–sum payments, so was largely unaffected by changes in the profits of the nonstate sector.

local governments would have little or no effect on the objective functions of either level of government but would be forecast to shift the allocation of resources away from the nonstate towards the state sector.

Behavior with periodic elections

So far, we have hypothesized that the differences in the allocation decisions made by officials in China vs. Eastern Europe can be explained by differences in the source of tax revenue in the two locations. One other important difference between China and Eastern Europe, though, is that officials in Eastern Europe face periodic elections whereas Chinese officials do not.[15] We have seen voters turn reform governments out of office in favor of parties composed of former Communist officials. The threat that this might occur perhaps constrained the aggressiveness of the reform process even prior to the election. Are the presence of elections in Eastern Europe then an alternative explanation for the observed lack of support for the private sector in Eastern Europe and the resulting mediocre economic performance during the reform period?

There certainly are many arguments in the existing literature for why the electoral process can induce inefficient behavior by politicians hoping to be reelected. Actions in the interest of the median voter for example need not be efficient, as argued at length by Buchanan and Tullock (1962). The median voter in Eastern Europe, for example, initially worked in the state–owned sector and had little prospect of moving into a private firm in the near future. As a result, this voter could well prefer that resources be allocated solely to the state sector even if the potential gains from allocating resources to the private sector are far larger — these larger gains, at least for the near future, go to a minority of voters.

In addition, individual voters have little or no incentive to become informed about the issues, since their vote has so little effect on the outcome. They may understand easily the effects of resources allocated to the state sector on their current wage rate and on their probability of being laid off in the near future. But understanding the implications

[15] These incentives are relevant primarily for elected officials. Bureaucrats are affected by electoral incentives only to the degree to which they are not protected by civil service restrictions from political pressures.

of particular resources allocated to the private sector on the growth rate of the private sector and the implied probability that the voter will be hired by the private sector would require much more effort and careful study. Without such study, uncertainty about the impact of current policy on this probability of getting a job in the private sector would lead voters to give little weight to such potential effects of current policy, again leading to an inefficient outcome.

Voters may also not behave as rationally as our theories would like to assume. The former Communist parties are normally much better financed than other parties, for example, and voters may be swayed by large campaign expenditures.

However, we will show that even if the voters care only about efficiency and even if they are fully informed, the voting process may still not be able to offset the inefficient financial incentives described in the previous section, and may even lead voters to support parties that favor allocating resources to the state sector. If, given the second–best nature of the problem voters face, even fully informed voters that care only about efficiency would gain by electing officials who favor the state sector, then the fundamental problem is these financial incentives rather than the existence of elections.

Our assumptions about the voting process are as follows: First, we make the extreme assumption that each voter cares only about overall profits, net of the costs of providing incentives to government officials. Voters therefore vote for the party that provides the maximum net gain to voters.[16] Second, they have full information about the candidates' true ideological preferences (the α's) of each party and the opportunities for corruption available to the officials (the δ and C). Third, we assume for simplicity that the penalties that officials potentially pay when they accept bribes take the form entirely of fines rather than real losses of resources. Voters therefore seek to maximize

$$\sum_{s=1}^{S}(1-\sigma_s-\gamma t_s)\pi_s(I_s)+(1-\sigma_n-\gamma t_n)\pi_n(I_n)-\sum_s B_{ns}-\sigma, \qquad (2)$$

[16] One implication of this assumption is that voters do not attempt to impose ex post punishments on parties that perform poorly. There is no ex post incentive to do so, and no way to precommit to such punishment strategies.

where allocation decisions are made based on equation (1) and where each B_{nj} is set so that the net bribe paid by each industry leaves the welfare of officials unaffected, given the bribery of other industries.

We make the additional assumption that voters can flexibly adjust the wage compensation of public officials so that they are just indifferent to becoming public officials, given their opportunity wage, y. For simplicity, we assume that the alternative jobs are equally attractive based on nonwage considerations and that individuals receive the same welfare based on their ideological convictions in either job, given that in equilibrium government behavior is unaffected by whether they individually choose to become a public official. As a result, the net financial compensation of officials simply equals y, and the voters' objective function reduces to $\sum_i \pi_i(I_i) - y$, — voters seek to maximize efficiency.

Finally, we assume that voting behavior is nonstochastic, so that competition among political parties results in the party platform most preferred by voters. In particular, we assume that voters can choose not only the α's of the elected officials but also the values of C and δ. In the process, can they induce an efficient allocation of resources? The first problem they face is assuring that the allocation of resources *within* the state sector is efficient. This can be done in two different ways. Either voters can select officials who agree to adopt legislation making C extremely high so that no industries will choose to bribe officials, or they can push for the elimination of any effective oversight on bribery so that all state industries engage in bribery. To then induce the desired allocation of resources between the state–owned firms and the private firms, voters can select officials with suitably high values of α_n relative to α_s. If they choose a low value of C, then α_n has to be larger than it would be if they choose a high value of C, given the stronger financial incentives that need to be offset to favor state firms.

These solutions, however, ignore various potential constraints. To begin with, the values of the α's must reflect the true ideological preferences of some credible officials. There simply may not exist officials with a strong enough ideological preference for private firms to offset fully the financial incentives any officials face to favor state–owned firms. In addition, it ignores the costs of enforcing high values of C and perhaps even the infeasibility of eliminating bribery entirely. Third, it ignores the possibility that the salary of officials

cannot fully adjust to compensate for bribery, perhaps because of minimum wage provisions or simply because salaries cannot adjust quickly enough to keep up with changing circumstances.[17]

How does the solution change once some of these additional factors are taken into account? To describe the range of possible complications, assume to begin with that C and δ are fixed at some values that lead some but not all industries to engage in bribery. Even with this modification, alone, the results change dramatically due to the second–best nature of the problem.

Consider what feasible values of the α's voters prefer to see in their public officials if we take C and δ as given. If we take as given the set of industries that engage in bribery, then it would appear that voters would try to select officials who have a low value of α_s relative to α_n, to compensate for the strong financial incentives that officials face to favor the state sector. However, while officials with a lower value of α_s would be more willing to allocate resources to the private sector, equation (1) implies that they would also be more responsive to bribery since bribes become larger relative to other considerations. The resulting shift of resources within the state sector towards bribing industries may reduce efficiency enough to more than outweigh any gains from the overall shift in resources towards the private sector.

Voters would need to take into account as well the effects of the choice of the α's on the set of industries that engage in bribery. Does bribery become more or less attractive as α_n or α_s change? Consider the impact, for example, of an increase in α_s. Some industry j chooses to bribe if profits net of the required bribe are higher than they would be without bribing, or if

$$\pi_j(I_j)(1-t_s) - B_j > \pi_j(I_j^{nj})(1-t_s),$$

where I denotes the equilibrium vector of allocations (when industry j bribes) and I^{nj} denotes the allocation when it does not bribe. Here, the required bribe, B_j, is set so as to

[17] In a richer setting, we would also worry about the effects of salary choice on the composition of individuals who choose to become officials. When salaries are low, only those most likely to be bribed would choose to be officials.

keep the utility of public officials unchanged, implying that

$$\sum_s (w_s+\delta d_s^j(1-t_s))\pi_s(I_s^{nj})+w_n\pi_n(I_n^{nj}) = \sum_s (w_s+\delta d_s^j(1-t_s))\pi_s(I_s)+w_n\pi_n(I_n)+\delta B_j-C, \tag{3}$$

where $d_s^j = d_s$ except that $d_j^j = 0$ to capture the welfare officials would have ignoring the bribery from industry j. Solving for B_j and substituting, we find that bribery occurs if

$$\sum_s (w_s+d_s\delta(1-t_s))\pi_s(I_s)+w_n\pi_n(I_n)-C > \sum_s (w_s+d_s\delta(1-t_s))\pi_s(I_s^{nj})+w_n\pi_n(I_n^{nj}), \tag{4}$$

or if the bribe raises the combined welfare of industry j and of public officials enough to cover the fixed cost C. As α_s increases, the left–hand side of equation (4) increases by $\sum_s \pi_s(I_s^j)$ whereas the right–hand side increases by $\sum_s \pi_s(I_s^{nj}) + \delta(1-t_s)\pi_j'(\partial I_j^{nj}/\partial\alpha_s)$. Bribery becomes more likely if the right–hand side increases by relatively less, or if the expression

$$\sum_s [\pi_s(I_s^j) - \pi_s(I_s^{nj})] - \delta(1-t_s)\pi_j' \frac{\partial I_j^{nj}}{\partial \alpha_s} \tag{5}$$

is positive, and conversely. Here, the first term in expression (5) measures the change in state–sector profits due to industry j engaging in bribery whereas the second term measures the impact of the increase in α_s on industry j profits when it does not bribe.

What can we say about the sign of expression (5)? To begin with, an increase in α_s causes I_j^{nj} to go up, as seen from equation (1), since the resulting increase in all the w_s will cause resources to be shifted out of the private sector into the state sector generally and also from state firms engaging in bribery towards state firms not engaging in bribery. This effect alone makes bribery less likely. The first term is also likely to be negative in an Eastern European context. When industry j engages in bribery, the extra resources it receives are unlikely to be coming from the private sector — the private sector will likely get nothing regardless of the behavior of industry j. Instead the extra resources will be coming from other state firms. Resources are allocated efficiently among state firms when either all of them or none of them engage in bribery. When most industries are already engaging in bribery, due e.g. to a ~~low~~ C, then efficiency rises when industry j bribes as well. In contrast, when most firms ~~do~~ not bribe, then efficiency falls when an additional

industry does engage in bribery. Since we have assumed that few industries are engaged in bribery, the first term should be negative, implying that bribery becomes less likely as α_s goes up.

Since voters care about efficiency, an increase in α_s, by reducing the number of industries engaged in bribery, will in and of itself increase efficiency by shifting resources out of the least efficient uses. While this must be counterbalanced against the overall shift of resources from the private sector into the state sector, this overall shift may be minor in an Eastern European context since the private sector has seemed to receive little or no resources from the government under any feasible set of officials. Therefore voters may well prefer to vote for high α_s officials in spite of the voters' preference for an efficient allocation of resources to the private sector.

If the compensation formula for officials cannot adjust to changes in the characteristics of the party in power, then further complications arise. Now, voters will need to take into account how overall payments to officials change, for example, as α_s increases, now for simplicity holding fixed the set of industries that pay them. If the formula for wage compensation is held fixed, total payments to officials equal

$$\sigma + \sum_{s=1}^{S}(\sigma_s + \gamma t_s)\pi_s(I_s) + (\sigma_n + \gamma t_n)\pi_n(I_n) + \sum_s d_s(\delta B_s - C), \tag{6}$$

where the size of each bribe, B_s, is determined by equation (3).

Equation (6) then implies, after some simplification using the first order conditions for the allocation decisions of officials, that the marginal change in total payments to officials as α_s increases equals

$$\sum_{j \in S^*}[\sum_s \pi_s(I_s^{nj}) - \sum_s \pi_s(I_s)] - S^* \left[\alpha_s \sum_s \pi_s' \frac{\partial I_s}{\partial \alpha_s} + \alpha_n \pi_n' \frac{\partial I_n}{\partial \alpha_s}\right]. \tag{7}$$

Here, the first term in brackets describes the sum of the amount by which state sector profits drop due to bribery in each of the S^* industries while the second term in brackets measures the impact of the resource reallocation on welfare, using the ideological weights of the officials. Each term in general is of ambiguous sign. The increase in α_s will shift resources out of the private sector into the state sector and will lead to a more efficient

allocation of resources within the state sector. Since few if any resources are likely to go to the private sector in any case, we expect the latter effect to be more important, suggesting that the second term reduces the value of the expression. To the extent that resources shift out of the private sector due to bribery, the first term is also negative. However, bribery also reduces the efficiency of the allocation of those resources allocated to the state sector, suggesting this term is positive. Our presumption has been that the latter effect is more important. Given that its size decreases to zero (and becomes negative) as the fraction of firms engaged in bribery approaches a majority, however, our presumption is also that the fraction bribing is large enough that the second term in equation (7) will be more important quantitatively, implying that the total bribes fall as α_s rises. This further increases the attractiveness of a high α_s to voters.

Increasing α_n may also look attractive to voters — any increase in the strength of ideological beliefs of officials lowers the importance of financial incentives, which were the source of the initial problem. More realistically, however, officials with a higher α_n are also likely to have a lower value of α_s, so have different beliefs rather than stronger beliefs. Officials with such a shift in preferences towards private sector activity will certainly allocate more resources to the private sector. However, as before the drop in α_s means that the resources still allocated to the state sector will be allocated less efficiently since ideology now provides less of a counterweight to bribery and since industries are more likely to engage in bribery and pay larger bribes. Following our presumption that few resources will be allocated to the private sector in any case, given the strength of the financial incentives favoring the state sector, we infer that the latter effects dominate and efficiency falls on net.

The model therefore suggests that voters in Eastern Europe may well have found it rational to favor the return of former Communist (high α_s) officials to power. This voting behavior says nothing directly, however, about the true political preferences of the voters. In the model, voters favor an efficient allocation, yet rationally vote for officials with quite different views than their own given the second–best nature of the problem they face. Another response of the voters could have been to favor parties with an ideological preference for those industries that do not pay bribes. For example, in Poland a party

favoring agriculture has been particularly successful, and agriculture is so decentralized that it would not plausibly be able to bribe public officials.

One residual question is why the electorate in general favored liberal parties initially and then shifted to voting for quite conservative (high α_s) parties. Initially, voters presumably expected the liberal parties to allocate substantial resources to the new private sector. When the economic downturn reduced the resources available to the government, however, any allocations to the private sector were likely crowded out, inducing voters to focus instead on the efficiency of remaining allocations within the state sector.

If we allow voters limited flexibility over the choice of C, e.g. through changes in the budget available to the Ministry of Justice, similar ambiguities arise about how they would choose to change C. The enforcement costs of keeping C high certainly need to be taken into account. Even without enforcement costs, though, for any given set of α's, it is not unambiguous whether an increase in C raises or lowers efficiency. An increase clearly reduces the number of industries that pay bribes, resulting in a shift of resources out of those industries that no longer pay bribes. While these resources may flow to the private sector or to the industries in the state sector that had not previously paid bribes, resulting in an increase in efficiency, they can also flow to the remaining industries that still pay bribes, lowering efficiency. Whether or not efficiency increases on net depends on which effect is more important. Ignoring enforcement costs and constraints on the range of feasible α's, either a very low C or a high enough C to prevent any bribery would imply an efficient allocation within the state sector.[18] In general there can be two local optima for the value of C, and the global optimum can well jump from one to the other as circumstances change.[19]

The trade–offs in setting δ are also complicated. If $\delta > \gamma$, then officials will allow those industries engaged in bribery to evade taxes, undermining the revenue base used to finance the resources I. There are strong pressures on voters therefore to keep δ below

[18] A low C, however, reduces resources in the private sector unless voters can compensate through electing a high σ_n party.

[19] Urban political machines in U.S. cities at the turn of the century, for example, undoubtedly faced very low values of C. With pervasive bribery, these cities functioned well economically. Preferences later shifted towards high values of C. Our argument suggests that there is no good middle ground.

γ.[20] Reducing δ further will reduce the attention paid to bribing industries, and will also reduce the number of bribing industries. As before, however, a reduction in the number of bribing industries in itself may either raise or lower efficiency depending on the fraction of industries engaged in bribery. In any case, reducing δ can require substantial expenditures on public prosecutors.

One simplification made above that merits further thought is the assumption that firms can make take–it–or–leave it offers to officials. If the relative bargaining power of officials is increased, and wage compensation of officials cannot adjust, then payments to officials become larger and the potential changes in their income a more important consideration. This would create an incentive for voters to reduce the amount of bribery that occurs relative to that present under the original assumptions. It also means that becoming an official is more attractive than alternative occupations, implying that individuals would be willing to engage in costly rent–seeking behavior in order to gain public office.[21] Whether or not officials dissipate the rents or reach some cooperative equilibrium among themselves in order to preserve these rents[22] does not matter for voters, however, since they must pay the costs in any case.

The relative bargaining power of officials would plausibly depend on the number of parties competing for office. The fewer the number of parties, the greater the threat that any one party currently in office has over firms. When there is only one party, as in China, there is no effective limit on the income level of public officials. It is not surprising therefore that the student demonstrators in China in 1989 focused so heavily on official corruption, in spite of our presumption that corruption there has not resulted in major misallocations of resources.

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[20] That countries such as Russia appear unsuccessful at doing this indicates the importance of enforcement costs, as well as the weak control of voters to date.

[21] Traditionally in China, for example, candidates would need to spend years studying the Confucian classics and passing grueling exams in order to gain public office.

[22] For example, parties can agree to legislation to limit campaign expenditures and agree not to undercut each other's proposed values of δ.

2. Implications of alternative tax systems

Initially during the transition in both China and Eastern Europe, the main tax was a profits tax. In the above model, tax incentives at least would encourage an efficient allocation as long as the effective tax rates are equalized across firms.

Even a uniform tax on profits, though, generates a variety of perverse incentives that were ignored in the above model. To begin with, taxing profits generates incentives to reduce new investment to the extent that public officials are not in office for the life of the new capital investment. New investments inevitably reduce short–term profits as the firm expends resources putting the new investment in place and learning how best to make use of it, while the offsetting profits normal accrue much later in time. As a result, incentives improve to the extent that officials expect to remain in office for a longer period. The more rapid turnover of officials in Eastern Europe than in China provides another explanation for the lack of support for new investment in the private sector in Eastern Europe.

With a profits tax, officials also have an incentive to help firms collude to gain more market power, in order to increase the size of aggregate profits. This incentive can be manifested in a variety of ways, e.g. regulatory harassment of new entrants, tariff barriers protecting existing monopolies, etc. Governments would also have an incentive to protect industries facing the highest tax rates. Chinese local governments, for example, have commonly acted to prevent imports of selective goods, presumably focusing on those goods where local firms pay particularly high effective tax rates. In addition, officials have an incentive to be supportive of firms when they bargain over wage rates with workers, again to preserve their tax base. When payroll is taxed at a comparable rate to profits, however, then the government would have little incentive to intervene in this wage bargaining.

Given the many perverse incentives created through reliance on a profits tax, there are strong reasons to replace it with a broader tax base, e.g. a value–added tax. Recently, for example, the national government in China started collecting a large share of its tax revenue through a value–added tax, with the same rate for state and nonstate firms. Some fraction of this tax revenue is then allocated to each local government. This tax reform should lead to more support for the private sector from the national government and less conflicts of interest between local and national governments.

A consumption tax base has other clear advantages. Policies that affect current and future earnings, for example, would be reflected immediately in current consumption (ignoring credit constraints), so that current consumption provides a good proxy for permanent income. Officials would then have the incentive to maximize permanent income of residents. At least given labor supply, this is consistent with maximizing efficiency.

There are some remaining incentive problems under a value–added tax, however. To begin with, imposing a value–added tax on the new private sector faces many of the same enforcement problems that were faced with the profits tax. Activity in this sector has been hard to monitor, making it difficult to impose any tax on it. To the extent that taxes are not in fact collected from the private sector, then the incentive on officials to favor the old state sector remains.

Even if the value–added tax were enforced equally on all firms, there are other problems. If officials will remain in office for a short time, they will focus on current consumption levels. Current consumption can be increased by policies discouraging savings and investment, or policies that relax credit constraints for households and increase them for firms, again leading to too little investment. Similarly, the shift of resources away from old state firms to new firms can lead to a temporary drop in value–added, given both the time workers spend searching for a new job and their lower initial productivity in the new job due to learning-by-doing. As a result, officials with a short horizon face an incentive to discourage this shift of resources.

When the value–added tax rate differs by good, officials would want to shift consumption away from the lightly taxed sectors. For example, services are normally exempt, creating an incentive to discourage the development of the service industry, which had also been neglected prior to the reforms. Excise tax rates have similar incentive effects to value–added taxes. For example, high excise tax rates on pollution emissions, cigarettes, or alcohol create an incentive on officials to encourage these outputs.

The above model suggests that when officials have been unsupportive of some sector, e.g. new private firms, the remedy is to increase the effective tax rate on these firms. There is an obvious cost to this remedy, however. Taxes on any set of firms discourage private individuals from investing in these firms even while it encourages public officials to support

them. In general, however, both private and public resources are allocated efficiently across sectors if tax rates are equalized across sectors (ignoring nontax incentives). The key trade–off that remains is that raising the overall marginal tax rate, holding the average tax rate constant, worsens private incentives at the same time that it strengthens the incentives faced by public officials. The trade off may not always be as stark as it at first appears, however. If the differing goods provided from public vs. private sources are complements in production (e.g. land vs. capital), then extra public allocations induced by increasing tax rates may well induce an increase in private allocations, in spite of the increase in the marginal tax rate.

3. Conclusions

Changing the behavior of governments in Eastern Europe has proven to be a more difficult and time–consuming process than was initially hoped. Our hypothesis is that an important component of the explanation is that current public officials still face strong financial incentives to favor the existing state–owned firms, at the expense of the newly emerging private sector. The tax revenue of the governments in Eastern Europe has come primarily from the state–owned firms, given the difficulties of monitoring the income of the newly emerging private sectors. Since the welfare of public officials is closely linked to the amount of tax revenue over which they have control, this has created an incentive to favor the state sector.

Initially, when tax revenue came primarily from profits taxes, incentives were even more perverse. Officials could raise profits, for example, by protecting local firms from foreign competition and helping them collude to gain market power.

The shift towards broader based taxes such as a value–added tax should help substantially to improve the incentives faced by officials. However, some problems remain. It may still be hard to collect revenue from new private firms. In addition, if officials expect to be in office for a short period, then they have an undue incentive to favor consumption over investment. Taxing the return to investment may help to offset these distorted incentives.

The problem of how best to design the incentives faced by public officials is a general one, and not one of concern simply in transition economies. We find it surprising that there

has not been more effort to make use of the insights from the principal–agent literature to think through how best to design the incentives faced by public officials.

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