

Taxability, Elections, and Government Support of Business Activity

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Abstract

Politicians care about tax revenues in part because they pay for transfers or public goods which are important to voters, and which are therefore important for the politician's reelection. When economic sectors differ in their taxability, i.e. the degree to which tax revenues can be extracted by the state, politicians will thus have an incentive to allocate their support for business activity unevenly across sectors. Formalization of this idea shows that politicians will be more inclined to favor high-taxability sectors when transfers or public goods are highly valued by voters, but less likely to do so when a country's overall tax capacity is high. Further, the allocation of support will depend on the relative size of the low- and high-taxability sectors, but not on the number of recipients of government transfers. Drawing upon a survey of firms in twenty-three postcommunist countries - where overall tax capacity is in many places quite low, differences in taxability across sectors is typically high, and government support for business activity is often lacking - the model's predictions are shown to hold generally in countries with well-developed political rights and civil liberties, but only partially in the rest of the postcommunist world. Politicians in more democratic countries seem to be motivated by the electoral concerns central to this paper, while their counterparts in less democratic states appear to be driven by revenue considerations for nonelectoral reasons.

1. Introduction

In many parts of the world, business activity is difficult without active political support. In such environments, poor protection of property rights, petty corruption, and bureaucratic inefficiency is the norm, and only the active intervention of senior politicians can assure treatment by lower-level government officials conducive to business development.

The question of who receives such support, and who does not, has been of particular concern to scholars of postcommunist political economy. Throughout most of postcommunist Europe and Asia, business development has been hampered by insecure property rights and the absence of an impartial, honest, and efficient bureaucracy. Corruption (Scheppelle 1999; Treisman 2002; Shelley 2000), protection rackets (Frye and Zhuravskaya 2000; Volkov 2000; Gustafson 1999), ineffective legal institutions (Sachs and Pistor 1997; Lambert-Mogiliansky, Sonin, and Zhuravskaya 2000; however, see Hendley, Murrell, and Ryterman 2001), and the “time tax” imposed by overregulation (EBRD 1999) have all contributed to the generally disappointing economic performance of postcommunist countries. Indeed, Johnson, McMillan, and Woodruff (2000) find such obstacles to be the principal constraint to business development in five postcommunist countries, outweighing such factors as access to bank finance.

At the same time, such impediments are not constant across firms or countries. Small firms are disproportionately burdened by overregulation and corruption, while firms in eastern Europe generally face fewer obstacles than those in the former Soviet Union (World Bank 2002; Hellman, Jones, and Kaufmann 2000; Frye and Shleifer 1997), a pair of observations

that is further developed in the empirical work presented in Section 3 below.¹ An emerging literature traces this variation in part to the character of incentives facing (often local) politicians (Shleifer 1997), including the nature of fiscal-federalist arrangements (Oi 1992; Qian and Weingast 1996; Zhuravskaya 2000), the availability of revenues from raw-materials extraction (Fish 1998), and the extent to which politicians are constitutionally obligated to face the judgement of voters (Hellman 1998).

This paper and its companions (Gehlbach 2003a, 2003b) extend and complement this literature by emphasizing that the degree of government support for business development is determined in part by the *taxability* of economic activity, i.e. the extent to which the state can extract revenues from economic agents. (Unlike tax rates, taxability is not a choice variable of the politician.) Behind this general argument are three premises: that politicians are interested in tax revenues, that it is easier for the state to extract revenues from some economic agents than from others, and that political support of business activity is costly to the politician (bureaucrats must be monitored, rents passed up from lower-level officials must be foregone). Put succinctly, the taxability argument says that the following two statements, often heard in conversations with entrepreneurs in postcommunist countries, are not unrelated:

- 1) “Corruption and overregulation are killing my business.”

¹Bureaucratic obstacles and political support also vary *within* countries. See, e.g., Stoner-Weiss (1997) for evidence from four Russian regions in the early 1990s, and CEFIR & World Bank (2002) for recent survey evidence from twenty Russian regions.

2) “Good entrepreneurs know how to avoid paying taxes.”

The idea that politicians are interested in tax revenues is not new, of course: North (1981), for example, bases his analysis of economic history on the premise that states are interested in maximizing revenues, while Tilly (1990) argues that the imperative of raising revenues to fight wars was instrumental in the development of the modern state. Moreover, many studies of the politics of taxation emphasize that economic sectors differ in their taxability (see, e.g., Levi 1988 and Lieberman 2001), a consideration which plays a role in a number of analyses of business-government relations, including the literatures on fiscal federalism, hybrid ownership forms in China, the “resource curse,” and colonialism.²

Gehlbach (2003a) generalizes these arguments by emphasizing the social-contract failure that forms the basis for government discrimination of highly taxable firms, and provides empirical evidence that politicians in postcommunist countries systematically discriminate against firms which are less taxable. Gehlbach (2003b) expands upon the basic insight by showing that when governments are interested in maximizing tax revenues and factors of production are mobile across sectors, differences in taxability across sectors suggest that countries will sort themselves into two groups: those where government support and re-

²The literature of fiscal federalism is referenced above. On township-village enterprises and the impact of local-government retention of revenues, see, e.g., Che and Qian (1998) and Gordon and Li (1997). With respect to the resource curse, Shafer (1994) argues that countries with large natural-resource sectors or similar “inflexible leading sectors” will develop “specialized tax authorities to tap the huge, concentrated revenue streams such sectors produce, and specialized agencies to monitor, regulate, and promote the activities of these few critical firms” (p. 13). On colonialism, Acemoglu, Johnson, and Robinson (2002) suggest that the choice of institutions by European colonial powers was influenced by the degree of taxability of existing, pre-colonial economies.

sources are concentrated in the low-taxability sector, and those where they are concentrated in the high-taxability sector. If one takes the low-taxability sector to be new, small firms (a point established in Gehlbach 2003b), then this is a fair characterization of the “great divide” (Berglof and Bolton 2002) separating eastern Europe from the former Soviet Union.

This paper, in contrast, takes factor allocation as given but develops a more nuanced view of political behavior. Rather than simply assuming that politicians are interested in tax revenue, the model presented in Section 2 examines the electoral motive for raising taxes. Taxes can be used to redistribute resources from one sector of the population to another (Subsections 2.1-2.3) or to pay for public goods (Subsection 2.4). In either case, a politician’s probability of reelection depends on his competence in producing tax revenues, which in this model means his competence in supporting (taxable) economic activity. Thus, rather than explaining the failure of politicians to support economic activity by their “short and insecure future ... in politics” (Shleifer 1997, p. 404; see also Olson (1993)), this paper essentially treats the politician’s discount rate as endogenous, with the allocation of support across sectors a function of the electoral return from supporting those sectors.

The model follows Holmstrom’s (1982) formalization of the idea that “career concerns” can motivate managers to exert effort in an attempt to appear more competent.³ Here, political support plays the role of effort, and elections replace labor markets. Similar applications of career-concerns models to electoral politics can be found in Persson and

³More generally, career-concerns models belong to a class of “signal-jamming models.” See Fudenberg and Tirole (1986).

Tabellini (2000, chs. 4, 9, and 16) and Lohmann (1998), though in those models effort is unidimensional. Dewatripont, Jewitt, and Tirole (1999a, 1999b) consider multidimensional effort, but in a nonelectoral setting. The model in this paper is also unusual in that it involves conflicts of interest among voters (principals).

More generally, this paper shares with many other models of electoral competition the assumption that politicians lack the ability to commit to following any particular policy after the election. Hence, voters base their voting decision only on the politicians' perceived competence in pursuing post-election policies, and not on any campaign promises. But in this paper, the lack of commitment power extends to the preelection period as well. Behind the assumption of exogenous taxability of economic activity is the argument that economic agents and the politician are not able to negotiate an efficient trade of revenues for support of business activity. As discussed in Gehlbach (2003a), the inability of the state to commit to any agreement to which it is a party is one of the primary reasons such a Coasian contract will typically be impossible. The costliness to the state of fully observing individual tax compliance and collective-action problems within society also play a role.

While voters in this paper fall into sectors which differ in their economic characteristics, it should be stressed that there is no collective action on the part of voters. Thus, in contrast to theories of group conflict that stress the role of sectoral characteristics in fostering collective action (e.g., Frieden 1991, Alt *et al* 1996), policy in this model is biased for or against groups based only on the way their group-specific characteristics map into voting behavior

(see Grossman and Helpman 2001, ch. 3 for a review of other models in this tradition).

Beyond reinforcing the general proposition that differences in taxability result in unequal allocation of political support across economic sectors, the model in this paper produces a number of more subtle theoretical results. First, it is not always the case that it is the high-taxability sector which receives more support. Which of the two sectors is favored depends on the degree to which the politics of redistribution is salient relative to other issues for different segments of the voting population, or on the degree to which the public good is valued by voters. When (some) voters care more about taxes paid than (others do) about the benefits those taxes provide, politicians will have an incentive to support the low-taxability sector. Second, when taxes are used as a means of redistribution, the allocation of political support across sectors is independent of the size of the population being redistributed to. Countries with more recipients but equivalent tax capacity will merely have less available for any individual recipient, meaning that recipients will be less likely to base their voting decisions on a politician's competence in providing transfers. Third, politicians will be more inclined to support the low-taxability sector when the government's overall tax capacity is high: as substitute methods of gaining votes, it is the relative electoral return from supporting each sector (influenced in part by overall tax capacity) that determines the politician's allocation of support. Thus, for example, if the low-taxability sector is populated by small firms, "big" governments will be more supportive of small-business activity.

After reviewing empirical evidence from Gehlbach (2003a), which is consistent with the

model in this paper but also with a more general model of a revenue-maximizing politician, Section 3 examines two empirical predictions specific to the electoral-competition model presented in Section 2. First, politicians in countries with larger recipient populations do *not* seem to be under greater pressure to support high-taxability sectors, supporting the model's (initially counterintuitive) prediction. Second, the degree to which highly taxable firms are favored depends negatively on the overall tax capacity of the country in which the firm resides, but only for the subset of postcommunist countries with well-developed political rights and civil liberties. In contrast, politicians in less democratic countries discriminate against less taxable firms, but independently of the country's overall tax capacity, a result consistent with a model of a revenue-maximizing politician but inconsistent with the electoral model of this paper. Thus, the data suggest that politicians in more democratic countries are driven by electoral concerns to favor firms which are relatively easy to tax, while nonelectoral considerations are behind the propensity of government officials in less democratic countries to provide disproportionate support to highly taxable firms.

2. Theory

2.1. Model With Redistributive Transfers

Consider an elected *politician* who cares about tax revenues and has some degree of control over the local business environment, and who chooses what level of support to provide to each of two different economic sectors. Most obviously, this is an elected local or regional

politician from the executive branch of government, though depending on the political-economic context the model may also describe the behavior of other political actors. The *support* of business activity provided by the politician is *not* the provision of subsidies to one industry or another, but rather the creation of an environment in which business can flourish. Thus, in contrast to subsidies, whose cost is borne by taxpayers and whose provision precludes other uses of government funds, political support is costly to the politician providing it, and may benefit individuals other than those in the supported sector through any subsequent increase in tax revenues.

One interpretation of this costly support, which is consistent with the empirical work presented in Section 3, is that the politician is engaged in a principal-agent relationship with lower-level bureaucrats, who in turn interact directly with economic agents. In many parts of the world, entrepreneurs and business managers are obliged by these bureaucrats to pay bribes, to spend time dealing with excessive regulation, etc.⁴ However, by various means - an explicit instruction to “lay off” certain sectors, foregoing a share of the rents passed up from subordinates⁵ - the politician can reduce the level of bureaucratic interference. This is the “political support” of this model. Critically, this support is costly: monitoring to assure instructions are followed takes time and energy, foregoing rents has an opportunity cost, etc. To keep the focus on the politician’s electoral incentives to support one sector or another,

⁴Guriev (2002) develops a model to show how corruption can lead to more “red tape.”

⁵Waller, Verdier, and Gardner (2000) provide a model of a corrupt politician sharing rents with a number of lower-level bureaucrats.

we do not model the politician-bureaucrat relationship explicitly, but simply assume that at some cost the politician can increase the profitability of a sector.

An alternative interpretation, albeit one not considered explicitly in the subsequent empirical work, is that a sector needs a legal framework of some sort to thrive.⁶ Thus, for example, the expansion of internet commerce in the U.S. was facilitated by the passage of legislation allowing for the recognition of electronic signatures. In the postcommunist world, the development of private commerce depended critically on price liberalization and the decriminalization of entrepreneurial activity. Given limitations of political capital and of space on the legislative calendar, opting to support business activity involves an opportunity cost in that other issues important to the politician may receive less attention.

Critically, the two economic sectors needful of political support differ in their exogenous *taxability*, i.e. the degree to which revenues important to the politician can be extracted by the state. Taxability thus includes both the ability of the state to collect taxes and the claim of the state on any profits of state-owned enterprises. In communist economies, these two means of collecting revenues were conflated. As discussed in greater detail below, one of the greatest challenges of postcommunist states has been finding ways to collect taxes after the state's ownership stake was relinquished. This difference in taxability implies possibly different levels of support for the two sectors. In what follows, we will refer to the sector that finds it easier to hide revenues as the *low-taxability sector*, and the other sector as the

⁶Drawing on the experience of advanced industrial economies, Steven Vogel (1996) has argued that “freer markets” sometimes demand “more rules.”

high-taxability sector.

It is worth stressing that taxability is not a tax rate, and is not chosen by the politician: it is the degree to which revenues can be extracted from economic agents. Again, it is perhaps best to think of the politician in this model as a regional politician, who thus takes tax rates chosen by the central government as given, but who has the ability to determine the nature of the local business environment. Since firms differ in their taxability, economic output will be taxed at differential levels even if the tax rate is constant across sectors. Alternatively, one can think of the politician in the model as choosing tax rates based on the Laffer curve for each sector: the more taxable a sector, the higher its tax rate.

In this paper, taxes collected by the state can be used either as a means of redistribution from one sector of the population to another, or to fund production of a public good valued by all members of the population. In this subsection we consider the redistribution motive; below we modify the model to incorporate public goods. As will be shown, the model yields qualitatively similar results regardless of the use of tax revenues, despite the fact that redistributive transfers involve sharper conflicts of interest between voter groups.

Formally, consider three groups of risk-neutral individuals: a group of voter/entrepreneurs active in the low-taxability sector, a group active in the high-taxability sector, and a group of recipients who receive redistributive transfers from the government. Normalize the size of the population to 1, and let the size of the three groups be N_L , N_H , and N_R , respectively, so that $(N_L + N_H + N_R) = 1$.

In addition to voters, there is an incumbent politician who decides how much support e_{st} to provide to both the low-taxability ($s = L$) and high-taxability ($s = H$) sector in period 1 and, possibly, period 2. At the conclusion of period 1, an election takes place, determining whether or not the incumbent politician remains in power and makes support decisions in period 2. If the incumbent politician is defeated, the challenger takes power and makes support decisions in period 2.. There is no election in the second period. Providing support is costly for either politician, with convex cost of support $c(e_{st})$. Each period that a politician is in power he receive exogenous rents R , which can represent either the pursuit of policies important to the politician but unimportant to voters, or perks of the office. In what follows, the term “politician” will refer to the incumbent politician in period 1 unless otherwise noted.

Each member of an active sector produces profits $\pi_{ist} = e_{st} + \theta_s$, where θ_s is a mean-zero random variable expressing the “competence” of the politician in power in supporting sector s .⁷ (For simplicity, we subscript θ only by sector s , but it should be remembered that θ_s refers to the competence of the politician in power in that period.) Generally speaking, this can be thought of as the support a politician provides to a sector if he puts in a normal day’s work without bearing the extra cost of monitoring bureaucrats, foregoing rents, etc. Since the skills required to support one sector (e.g., large state-owned enterprises) may be

⁷The assumption that the economic benefit of political support in this first period does not persist to the second is unimportant, so long as the degree to which the benefit persists is independent of whether or not the incumbent is reelected. Also, note that if we want to assure that profits are strictly positive for all individuals in both periods, we can generalize the profit function as $\pi_{ist} = v_s + e_{st} + \theta_s$, where v_s is an exogenous variable arbitrarily large. The analysis is identical.

different from those required to support another (e.g., small private enterprises), θ_L does not necessarily equal θ_H . Specifically, assume competence θ_s to be independently and identically distributed across sectors $s = \{L, H\}$ and across politicians, with density function $f(\cdot)$ and distribution function $F(\cdot)$ defined over a limited support.

As in other career-concern models of this variety, we will assume that there is no information asymmetry between the politician and voters with respect to the politician's competence, and that all parties concerned are uncertain *a priori* about the politician's competence in supporting each of the two sectors. This might reflect the politician's inexperience in dealing with economic challenges which differ across sectors. For simplicity, assume that θ_s is completely unknown to both politician and voters prior to the politician's choosing his level of support; more generally, we might assume that there is both a known and an unknown component to θ_s , so long as the politician knows no more than voters do.

Critically, voters cannot observe either e_{st} or θ_s individually, but prior to voting in period 1 do observe the sum $k_{s1} \equiv (e_{s1} + \theta_s)$ for each sector. As will be shown, voters can impute θ_s from their beliefs about the politician's behavior, and use that imputed value in deciding whether or not to vote for reelection. (The relevance of the model relies to some extent on the assumption that active-sector voters are no more able to observe competence than are recipient voters.) If reelected, the incumbent politician's competence persists from the first period to the second. Thus, voters have an interest in reelecting politicians whom they perceive to be competent. If defeated, the challenger takes power, with $E(\theta_L) = E(\theta_H) = 0$.

Proportion T_s of the profits of each member of the active population is extracted as taxes, so that active-sector voters receive after-tax returns of $(1 - T_s)(e_{st} + \theta_s)$. Obviously, given notation, $T_L < T_H$. Assume that the government budget constraint is binding in each period, so that all taxes collected are paid out as redistributive transfers to the recipient sector. Thus, letting g_t be total government transfers per recipient in period t , the government budget constraint is:

$$N_R \cdot g_t = N_L T_L (e_{Lt} + \theta_L) + N_H T_H (e_{Ht} + \theta_H) \quad (2.1)$$

Finally, in addition to their material concerns (which are identical for all individuals in a given sector), voters have idiosyncratic “ideological” preferences which cause them to support the incumbent politician to a greater or lesser degree. Let δ_i refer to voter i ’s ideological preference for the *challenger*, so that a voter will support the incumbent for reelection if:

$$\begin{aligned} & E(\text{transfers/post-tax profits} \mid \text{incumbent reelected}) \\ & \geq \delta_i + E(\text{transfers/post-tax profits} \mid \text{challenger elected}) \end{aligned} \quad (2.2)$$

The politician knows the distribution of δ_i , but does not observe it for any individual voter. A common interpretation of this term in electoral-competition models is that δ_i represents preferences over policies with which politicians have little freedom of maneuver. Thus, δ_i might capture the degree to which voters support a position held by a candidate (or party)

for long enough that any change in policy would result in a loss of credibility. Alternatively, δ_i could represent voters' preferences over issues of supreme importance to party chieftains or funders, and thus over which candidates have little autonomy.

Assume δ_i to be distributed uniformly and independently across sectors over the interval $[-\frac{1}{2\gamma_s}, \frac{1}{2\gamma_s}]$, where the γ_s 's are sufficiently large (relative to the support of θ_L and θ_H) to insure that the incumbent's vote share always falls strictly between 0 and 1. The parameters γ_s thus capture the degree to which voters value the material concerns at the center of this model over other issues: a large γ_s implies that voters differ little according to their "ideological" preferences, so that a politician's competence in supporting business activity (and thus producing tax revenues) has great relative importance in the voting decision.

While preference heterogeneity is the standard definition of γ_s in electoral-competition models of this type, there is an alternative interpretation which may be more familiar to many political scientists. Assume that δ_i is distributed uniformly along $[-\frac{1}{2}, \frac{1}{2}]$ rather than along $[-\frac{1}{2\gamma_s}, \frac{1}{2\gamma_s}]$, but that voters in different groups attach different levels of importance to government support of firms (and thus tax revenues) relative to other issues. Let γ_s be a "salience" parameter that captures the degree to which post-tax profits or transfers are important relative to the issues represented in the preference term δ_i , so that a voter in

sector s will support an incumbent for reelection if:

$$\begin{aligned} & \gamma_s E(\text{transfers/post-tax profits} \mid \text{incumbent reelected}) \\ \geq & \delta_i + \gamma_s E(\text{transfers/post-tax profits} \mid \text{challenger elected}) \end{aligned} \quad (2.3)$$

For example, if redistributive transfers represent pension payments critical to the recipient population, one might expect γ_R to be large relative to γ_L and γ_H , so that non-pension considerations matter less for recipients on election day than they do for taxpayers. The analysis is identical. In what follows, γ_s will sometimes be referred to as the “importance” or the “salience” of profits or transfers relative to other issues, language consistent with this alternative interpretation. For simplicity, we will assume that γ_s is identical for the two active sectors, so that $\gamma_L = \gamma_H = \gamma$, but that γ_R is possibly different from γ .⁸

Note that, unlike in many models of electoral competition, there is no uncertainty about the distribution of ideological preferences. The source of electoral uncertainty in this model is that the politician does not know the realization of θ_L and θ_H when he chooses the level of support for each sector in period 1. The incumbent wins reelection if one half or more of voters vote to reelect after observing k_{L1} and k_{H1} and imputing θ_L and θ_H .

The timing of events is illustrated in Figure 1.

FIGURE 1

⁸The comparative-statics results below will be qualitatively similar so long as γ_H and γ_L are “close enough.” For example, if $\gamma_H \neq \gamma_L$, support for the low-taxability sector will still be increasing in overall tax capacity (Proposition 6) so long as $\gamma_R(\gamma_L - \gamma_H) - (T_H - T_L)(\gamma_R - \gamma_H)(\gamma_R - \gamma_L) < 0$.

2.2. Model With Redistributive Transfers: Equilibrium

We look for a perfect Bayesian equilibrium in pure strategies, where our primary focus is the equilibrium level of support in period 1. We begin by considering what happens in period 2. Whether the incumbent or the challenger from period 1 is in power, the politician in period 2 solves the following problem:

$$\max_{e_{L2}, e_{H2}} R - c(e_{L2}) - c(e_{H2}) \quad (2.4)$$

Clearly, the solution to this problem is $e_{L2}^* = e_{H2}^* = 0$. Without the discipline of an upcoming election, the politician in period 2 provides no costly political support to either sector. Period-2 profits (and hence tax revenues and redistribution) are determined entirely by the competence of the politician in power after the election: $\pi_{is2} = \theta_s$. Thus, voters have an interest in returning competent incumbents to power. What distinguishes this model from similar electoral-competition models is that the politician's competence is multidimensional, and that voters differ in the weights they put on competence in supporting each of the two sectors.

Rather than directly observing the incumbent's competence, however, voters observe only the incumbent's overall performance, which is the sum of competence and support in period 1, $k_{s1} \equiv (e_{s1} + \theta_s)$. Thus, the incumbent has an incentive to engage in costly political support in an attempt to appear more competent and increase his chances of reelection.

Formally, the incumbent politician in period 1 solves:

$$\max_{e_{L1}, e_{H1}} R - c(e_{L2}) - c(e_{H2}) + \Pr(\text{win} \mid e_{L1}, e_{H1})R \quad (2.5)$$

The key to the model is deriving an expression for $\Pr(\text{win} \mid e_{L1}, e_{H1})$. Bygones are bygones, so that voters vote for the incumbent only if they expect good things from him in the future, but past performance is a guide to future performance.

Establish notation such that variables with tildas refer to voters' beliefs. Thus, $\tilde{\theta}_L$ refers to the value of θ_L imputed by voters based on observed performance k_{L1} and their beliefs about what action has been taken by the incumbent, \tilde{e}_{L1} , i.e. $\tilde{\theta}_L = \tilde{\theta}_L(k_{L1}, \tilde{e}_{L1})$. Similarly, $\tilde{\theta}_H = \tilde{\theta}_H(k_{H1}, \tilde{e}_{H1})$.

To determine $\Pr(\text{win} \mid e_{L1}, e_{H1})$, we must derive the voting rule for voters in all three groups. Begin by focusing on voters in the low-taxability sector. Voters in this group expect profits in period 2 of $(1 - T_L)(e_{L2}^* + \tilde{\theta}_L)$ if the incumbent is reelected, vs. $(1 - T_L)(e_{L2}^*)$ should the challenger win, as the challenger is untested and has $E(\theta_L) = E(\theta_H) = 0$. Taking into account ideological considerations, a voter in sector L will vote to reelect the incumbent if:

$$(1 - T_L)(e_{L2}^* + \tilde{\theta}_L) \geq \delta_i + (1 - T_L)(e_{L2}^*) \quad (2.6)$$

Expected post-tax profits from reelecting the incumbent must be sufficiently greater than profits from reelecting the challenger to offset any ideological bias in favor of the challenger.

Recalling that $e_{L2}^* = e_{H2}^* = 0$, we have the following condition for a voter in sector L to vote to reelect the incumbent:

$$\delta_i \leq (1 - T_L)\tilde{\theta}_L \quad (2.7)$$

The more the incumbent's perceived competence, the more a voter must be inherently biased against the incumbent to vote against him. But the more that voters in sector L anticipate giving up their profits in the form of taxes, the less important is this perceived competence relative to other (“ideological”) considerations.

Given that δ_i is uniformly distributed along $[-\frac{1}{2\gamma}, \frac{1}{2\gamma}]$, we can derive the proportion of voters in sector L supporting the incumbent as:

$$\frac{1}{2} + \gamma(1 - T_L)\tilde{\theta}_L \quad (2.8)$$

The incumbent will receive a majority of the votes in sector L if his perceived competence is greater than the expected competence of the challenger, i.e. $\tilde{\theta}_L > 0$. However, the size of that majority will depend on the responsiveness of voters in the low-taxability sector to competence concerns. If any gains from competence are simply taxed away, voters in sector L will instead base their voting decision on their preferences over other issues, i.e. on δ_i . In contrast, the more homogenous is the population of sector L with respect to their preferences over these other issues, i.e. the higher is γ , the more competence matters in determining the proportion of voters supporting the incumbent for reelection.

Similarly, we can derive the condition for a voter in sector H to vote to reelect the incumbent as:

$$\delta_i \leq (1 - T_H)\tilde{\theta}_H \quad (2.9)$$

implying that the proportion of voters in sector H supporting the incumbent is:

$$\frac{1}{2} + \gamma(1 - T_H)\tilde{\theta}_H \quad (2.10)$$

In contrast to voters in active economic sectors, who care only about competence in supporting their own economic activity, recipients of redistributive transfers take into consideration the incumbent's skill in raising tax revenues overall, which depends on competence in both sectors. Given the government budget constraint (2.1), recipient voters anticipate period-2 transfers of $\frac{1}{N_R}[N_L T_L(e_{Lt}^* + \tilde{\theta}_L) + N_H T_H(e_{Ht}^* + \tilde{\theta}_H)]$ should the incumbent win, and transfers of $\frac{1}{N_R}[N_L T_L(e_{Lt}^*) + N_H T_H(e_{Ht}^*)]$ should the challenger win. As with other voters, recipients vary in their inherent bias towards the challenger, and anticipate that neither incumbent nor challenger will engage in costly support in period 2. Thus, the decision rule for a recipient voter is to vote for the incumbent if:

$$\delta_i \leq \frac{1}{N_R}(N_L T_L \tilde{\theta}_L + N_H T_H \tilde{\theta}_H) \quad (2.11)$$

The higher is the incumbent's perceived competence in supporting either sector, the more predisposed towards the challenger a recipient voter must be to vote against the incumbent. However, the degree to which competence in supporting a sector matters depends on the contribution of that sector to tax revenues: recipients of government transfers will tend to discount skill in supporting a sector if that sector's small size or low taxability means it contributes little to budget coffers. Integrating across all recipient voters, we have the proportion of the recipient population voting for the incumbent as:

$$\frac{1}{2} + \frac{\gamma_R}{N_R}(N_L T_L \tilde{\theta}_L + N_H T_H \tilde{\theta}_H) \quad (2.12)$$

where we recall that the responsiveness of recipient voters to material concerns is in general different from that of voters in active economic sectors, i.e. $\gamma_R \neq \gamma$.

Multiplying the proportion of voters in all three groups (2.8), (2.10), and (2.12) by the fraction of voters in each group, we arrive at the total number of voters supporting the incumbent given the imputed values $\tilde{\theta}_L$ and $\tilde{\theta}_H$:

$$\frac{1}{2} + [\gamma + T_L(\gamma_R - \gamma)]N_L \tilde{\theta}_L + [\gamma + T_H(\gamma_R - \gamma)]N_H \tilde{\theta}_H \quad (2.13)$$

For given perceptions of competence in supporting an economic sector, a politician will receive more votes, the larger that sector. Size matters for two reasons: there are more voters in large sectors than in small sectors, and large sectors contribute more to the budget

for redistributive transfers. In a sense, what is good for Gazprom is good for Russia, or at least more of Russia than just Gazprom: large companies not only employ many individuals, but through their tax payments provide for pensions and other redistributive transfers.

The relationship between taxability of a sector and a politician's competence in supporting it is more subtle. An increase in taxability makes the politician's vote share more sensitive to competence in supporting that sector only if $\gamma_R > \gamma$, i.e. only if recipients are more homogenous in their preferences over other issues than are individuals active in that sector. Recall that an increase in taxability makes voters in active sectors less responsive to performance relative to other issues - any increased profits are simply taxed away - while the same increase in taxability makes recipients more responsive, since a larger share of profits is passed along to them in the form of transfers. Recipients have to care more about the transfers they receive than do taxpayers about the taxes they give up for an increase in taxability to translate into an increased incentive to support a sector.

We can now derive $\Pr(\text{win} \mid e_{L1}, e_{H1})$ in the incumbent politician's problem (2.5). For notational simplicity, define the new variable $Z_s = [\gamma + T_s(\gamma_R - \gamma)]$, so that the number of voters supporting the incumbent is $\frac{1}{2} + Z_L N_L \tilde{\theta}_L + Z_H N_H \tilde{\theta}_H$. Thus, the probability that the incumbent wins, which is the probability that his vote share is at least $\frac{1}{2}$, is

$$\Pr\left[\frac{1}{2} + (Z_L N_L \tilde{\theta}_L + Z_H N_H \tilde{\theta}_H) \geq \frac{1}{2}\right] = \Pr(Z_L N_L \tilde{\theta}_L + Z_H N_H \tilde{\theta}_H \geq 0) \quad (2.14)$$

The incumbent seeks to increase his probability of winning by providing support to the

two active sectors in an attempt to raise voters' estimates of his competence, $\tilde{\theta}_L$ and $\tilde{\theta}_H$. In essence, he hopes to make voters believe he is more competent than he actually is by providing more support than they believe he has provided. Of course, in equilibrium voters' beliefs will be correct, meaning that the politician cannot fool the voters into thinking him more competent. But he nonetheless wants to provide support, since to fail to do so would suggest incompetence: “[H]e is trapped in supplying the equilibrium level that is expected of him, because, as in a rat race, a lower [level of support] will bias the evaluation process against him” (Holmstrom 1982, p. 172).

Recall that $\tilde{\theta}_L$ and $\tilde{\theta}_H$ are random variables, dependent on the realization of the random variables θ_L and θ_H (since $\tilde{\theta}_s = \tilde{\theta}_s(k_{s1}, \tilde{e}_{s1})$, where k_{s1} is a random variable equal to $e_{s1} + \theta_s$). In equilibrium, any realization of k_{s1} within the interval $[\tilde{e}_{s1} - a, \tilde{e}_{s1} + a]$ can be observed with positive probability, as θ_s has a support of $[-a, a]$. Since voters' beliefs are correct in equilibrium, this implies that for any $k_{s1} \in [\tilde{e}_{s1} - a, \tilde{e}_{s1} + a]$, voters will impute the value of $\tilde{\theta}_s$ as $k_{s1} - \tilde{e}_{s1} = e_{s1} + \theta_s - \tilde{e}_{s1}$. To solve for the equilibrium, however, we must make some assumptions about off-the-equilibrium-path beliefs:

Assumption 1: For observations off the equilibrium path, i.e. for $k_{s1} \notin [\tilde{e}_{s1} - a, \tilde{e}_{s1} + a]$, voters have the following beliefs about the type they are facing:

$$\begin{aligned}\tilde{\theta}_s &= a \text{ if } k_{s1} > \tilde{e}_{s1} + a \\ \tilde{\theta}_s &= -a \text{ if } k_{s1} < \tilde{e}_{s1} - a\end{aligned}\tag{2.15}$$

Assumption 1 says that if voters observe performance “impossibly high,” i.e. higher than possible given the politician’s equilibrium strategy, then they will assume that competence takes its highest value. Assumption 1 is thus a monotonicity condition, as it implies that voters would never assume that performance of $k_{s1} = \tilde{e}_{s1} + a$ implies competence of a , while performance of $k_{s1} > \tilde{e}_{s1} + a$ implies competence of less than a . (Similar statements apply to realizations of k_{s1} “impossibly low.”) Without this assumption, implausible equilibria could be supported in which voters assumed that high performance implied low competence, thus robbing the politician of the incentive to provide more support than expected.

Before solving for the equilibrium level of support for each of the two sectors in period 1, we introduce some notation:

$$\bar{f}(c) \equiv \int_{-\infty}^{\infty} f(cx)f(x)dx \tag{2.16}$$

It is worth emphasizing that $\bar{f}(c)$ is always greater than zero, since it is simply a sort of “average density” of a random variable.

Proposition 1. *The unique pure-strategy perfect Bayesian equilibrium consistent with Assumption 1 has support in period 1 defined by:*

$$\begin{aligned} c'(e_{L1}^*) &= \bar{f}\left(-\frac{Z_H N_H}{Z_L N_L}\right)R \\ c'(e_{R1}^*) &= \bar{f}\left(-\frac{Z_L N_L}{Z_H N_H}\right)R \end{aligned} \tag{2.17}$$

Proof. See appendix. ■

Interpretation of Proposition 1 is left primarily to the following section, but two results are immediately apparent: the equilibrium level of support in each sector in period 1 is greater than zero, i.e. greater than the level of support in period 2, and is increasing in R . In other words, politicians provide more support during election periods than during off-election periods because of their desire to get reelected; the more important is reelection to them, the more support they provide.

2.3. Model With Redistributive Transfers: Comparative Statics

To develop more interesting comparative-static results, we must put some structure on the distribution of the random variables θ_L and θ_H . In particular, assume:

Assumption 2: $\frac{\partial \bar{f}(c)}{\partial c} = \int x f'(cx) f(x) dx > 0$ if $c < 0$

A sufficient (but not necessary) condition for Assumption 2 to hold is that $f(x)$ is a single-peaked distribution with its peak at zero, as for x to the left of zero, $x < 0$ and $f'(cx) \leq 0$, while to the right of zero the opposite is true. In the present context, Assumption 1 says that e_{L1} and e_{R1} are substitutes: an increase in e_{L1} decreases the marginal electoral return to e_{R1} , and vice-versa. One of the few plausible distributions which does not satisfy Assumption 2 is the uniform distribution: if θ_s is distributed uniformly the marginal electoral return to support is constant, i.e. independent of the level of support in either sector. A U-shaped distribution would not satisfy Assumption 1, but it seems empirically unlikely that extreme

competence would be more common than average competence.

All propositions in this subsection are simple implications of Proposition 1 and Assumption 2, where we recall that $\frac{Z_H N_H}{Z_L N_L} = \frac{[\gamma + T_H(\gamma_R - \gamma)] N_H}{[\gamma + T_L(\gamma_R - \gamma)] N_L}$. For reasons of space, proofs are omitted.

“Support” refers to support in period 1.

Proposition 2. *Support for the low-taxability sector is decreasing in γ_R , while support for the high-taxability sector is increasing in γ_R . Support for the low-taxability sector is increasing in γ , while support for the high-taxability sector is decreasing in γ .*

The parameter γ_R captures the degree to which transfers are important to recipients (relative to other issues), while γ reflects the extent to which post-tax profits are important to active-sector voters. If transfers are important (γ_R is high), then the politician will try to win votes by increasing tax revenues, which is easiest if he supports the high-taxability sector. In contrast, if post-tax profits are important (γ is high), then the politician will attempt to increase his chances of reelection by pleasing active-sector voters, which is easier if he supports the low-taxability sector (high-taxability voters discount government performance since higher profits are taxed away).

This result – that the degree to which the high-taxability sector is favored depends on the value that taxpayers and recipients place on government performance vs. other issues – is not obvious from simple arguments that the government is more likely to favor sectors that are easy to tax. As the following proposition shows, if $\gamma_R < \gamma$, greater taxability actually results in *less* government support: active-sector voters are more inclined to reward performance

than are recipients, but do so less, the more the profits from that performance are taxed away.

Proposition 3. *Support is increasing in own-sector taxability, i.e. $\frac{\partial e_{s1}^*}{\partial T_s} > 0$, if $\gamma_R > \gamma$; is decreasing if $\gamma_R < \gamma$; and is constant if $\gamma_R = \gamma$.*

Nonetheless, a reasonable guess is that in many political-economic contexts recipients care more about transfers than do taxpayers about post-tax profits, i.e. $\gamma_R > \gamma$. Pensioners and other recipients of government transfers may be particularly dependent on government performance for their standard of living, and thus particularly likely to reward or punish politicians based on their ability to provide those transfers. The enduring image of Dan Rostenkowski under physical assault by AARP members is a potent reminder of the salience of redistributive transfers to those who rely on them most.

Proposition 4. *Support for the low-taxability sector is increasing in the ratio of the size of the low- and high-taxability sectors, $\frac{N_L}{N_H}$, while support for the high-taxability sector is decreasing in this ratio.*

As discussed above, there are two reasons a sector is more likely to receive a politician's attention if it is large: there are many voters in that sector, and the sector accounts for a large share of government revenues. The dilemma of firms stuck in the smaller sector is captured in the following statement by a representative of the Russian information-technology industry:

Our country’s primary misfortune is its enormous quantity of natural resources, which allow the government to practically ignore all other branches of the economy, which together are only a meager fraction of the size of the natural-resource sector.⁹

Proposition 4, while reasonable, is not too surprising. The following proposition is initially more counterintuitive:

Proposition 5. *The level of support for each sector is independent of the size of the recipient population, N_R .*

At first blush, this seems implausible: more recipients should drive greater demand for tax revenues, which should encourage the government to support the high-taxability sector. But Proposition 5 refers to a shift in N_R for a given T_L and T_H . Holding taxability in each sector constant, an increase in the number of recipients simply results in less for any individual recipient. While more individuals base their vote on the politician’s competence in providing transfers, each such voter attaches less weight to competence and more to other issues, since competence means less when the number of recipients is large.

In this model, it is the government’s “power to tax” (Brennan and Buchanan 1980) – T_L and T_H – rather than the size of the recipient population that drives the politics of redistribution. Countries where little tax revenue can be extracted from economic agents

⁹Karachinskii (2001, p. 47). Author’s translation from the Russian.

should find their politics dominated by other considerations. One might expect governments in those countries to thus be less likely to favor economic activity simply because it is highly taxable. In fact, the following proposition shows that the opposite result holds.

Proposition 6. Define $T \equiv \frac{T_L + T_H}{2}$, $\Delta \equiv T_H - T_L$.¹⁰ So long as $\gamma_R \neq \gamma$, support for the low-taxability sector is increasing in T , while support for the high-taxability sector is decreasing in T . If $\gamma_R = \gamma$, support for each sector is independent of T .

Holding constant the difference in taxability between the two sectors, an increase in the overall tax capacity of the government results in a reallocation of government support away from the high-taxability sector towards the low-taxability sector. To see why this is the case, recall from Proposition 3 that $\gamma_R > \gamma$ implies that the politician will *more* be inclined to support a sector if it is more taxable. That result holds for both sectors, but it matters more (in elasticity terms) for the low-taxability sector since $[\gamma + T_L(\gamma_R - \gamma)] < [\gamma + T_H(\gamma_R - \gamma)]$. In contrast, if $\gamma_R < \gamma$, a politician will be *less* inclined to support a sector if it is more taxable. Again, that result holds for both sectors, but with $\gamma_R < \gamma$ it matters more for the high-taxability sector, since now it is true that $[\gamma + T_L(\gamma_R - \gamma)] > [\gamma + T_H(\gamma_R - \gamma)]$. More concisely, an increase in overall tax capacity affects the low-taxability sector more when taxability translates into increased political support, and affects the high-taxability sector more when taxability translates into decreased political support. Only when $\gamma_R = \gamma$, i.e.

¹⁰Note that it does not matter where we “anchor” overall tax capacity, i.e. we can choose any T between T_L and T_H , since this comparative-static result is with respect to a common change in the level of T_L and T_H , holding the difference between T_L and T_H constant.

when by Proposition 3 taxability does not matter at all, does overall tax capacity have no effect. As we will see in Section 3, it is in fact the case that differences in taxability matter less in postcommunist countries the more the government extracts in tax revenues, though only for those countries with well-developed political rights and civil liberties.

Proposition 7. *Support for the low-taxability sector is decreasing in Δ if $\gamma_R > \gamma$, increasing if $\gamma_R < \gamma$, and constant if $\gamma_R = \gamma$. Conversely, support for the high-taxability sector is increasing in Δ if $\gamma_R > \gamma$, decreasing if $\gamma_R < \gamma$, and constant if $\gamma_R = \gamma$*

Proposition 7 is closely related to Proposition 3: holding the overall level of taxability constant, an increase in the “taxability gap” results in more support for the high-taxability sector (and less for the low-taxability sector) only if $\gamma_R > \gamma$. Politicians are more inclined to support highly taxable activity when they are rewarded for producing government transfers. They are more likely to support less-taxable activity when they are rewarded for producing post-tax profits.

2.4. Model With Public Good

In addition to redistributive transfers, taxes can be used to pay for public goods. In this subsection we modify the model above so that there is no recipient sector, with taxes paying for a public good consumed by all members of the active population. As will be seen, the same qualitative results hold in this alternative formulation, despite the fact that redistributive transfers and public goods differ in the nature of the conflicts of interest they generate.

Since there are no recipients of redistributive transfers, $(N_L + N_H) = 1$. Denote per-capita consumption of the public good as g_t . The government budget constraint then implies:

$$g_t = (N_L + N_H)g_t = N_L T_L(e_{Lt} + \theta_L) + N_H T_H(e_{Ht} + \theta_H) \quad (2.18)$$

Assume that all individuals receive utility from consumption of the public good of αg_t .

Then an individual in sector L will vote for the incumbent if:

$$\begin{aligned} & (1 - T_L)(e_{L2}^* + \tilde{\theta}_L) + \alpha[N_L T_L(e_{Lt}^* + \tilde{\theta}_L) + N_H T_H(e_{Ht}^* + \tilde{\theta}_H)] \\ \geq & \delta_i + (1 - T_L)(e_{L2}^*) + \alpha[N_L T_L(e_{Lt}^*) + N_H T_H(e_{Ht}^*)] \end{aligned} \quad (2.19)$$

i.e., if:

$$\delta_i \leq (1 - T_L)\tilde{\theta}_L + \alpha(N_L T_L \tilde{\theta}_L + N_H T_H \tilde{\theta}_H) \quad (2.20)$$

This implies that the proportion of voters in sector L supporting the incumbent is:

$$\frac{1}{2} + \gamma[(1 - T_L)\tilde{\theta}_L + \alpha(N_L T_L \tilde{\theta}_L + N_H T_H \tilde{\theta}_H)] \quad (2.21)$$

A similar expression can be found for the proportion of voters in sector H supporting the incumbent. Summing across all voters, the total vote for the incumbent is:

$$\frac{1}{2} + [1 + T_L(\alpha - 1)]\gamma N_L \tilde{\theta}_L + [1 + T_H(\alpha - 1)]\gamma N_H \tilde{\theta}_H \quad (2.22)$$

Defining $z_s = [1 + T_s(\alpha - 1)]$, the probability the incumbent wins is then:

$$\Pr\left[\frac{1}{2} + \gamma(z_L N_L \tilde{\theta}_L + z_H N_H \tilde{\theta}_H) \geq \frac{1}{2}\right] = \Pr(z_L N_L \tilde{\theta}_L + z_H N_H \tilde{\theta}_H \geq 0) \quad (2.23)$$

which is exactly analogous to the second term in (2.14). Thus, the equilibrium in the public-goods model is isomorphic to that in the redistributive-transfers model, and comparative-statics results are similar, where the terms in z_s replace those in Z_s . These similarities can be captured in the following two propositions:

Proposition 8. *(Proposition 2 analogue.) In the public-goods model, support for the low-taxability sector is decreasing, and support for the high-taxability sector is increasing, in the degree to which individuals value the public good, α .*

Proposition 9. *In the public goods model, Propositions 3, 4, 6, and 7 hold, where the condition $\gamma_R \gtrless \gamma$ is replaced by the condition $\alpha \gtrless 1$.*

Proposition 5 is obviously irrelevant in the public-goods model, as there is no recipient population. In this model, every voter is both taxpayer and consumer of public goods, implying that conflicts of interest between groups are muted, but that each voter must weigh the desire for public goods against their cost. As Propositions 8 and 9 show, the qualitative result is the same. The more individuals value the public good, the greater the incentive of the government to obtain tax revenues to provide that good, which it can best do by supporting the high-taxability sector. If the public good is provided such that

marginal social benefit is greater than marginal social cost (ignoring the cost of government support), i.e. $\alpha > 1$, then an increase in taxability encourages greater government support. As before, an increase in the overall tax capacity of the government, i.e. an increase in $T \equiv \frac{T_L + T_H}{2}$ holding $\Delta \equiv T_H - T_L$ constant, encourages the government to provide more support to the low-taxability sector.

3. Empirical Evidence - Government Support of Business in Post-communist States

Taxability of economic activity is a major issue for postcommunist states. Under communism, tax revenues were collected primarily from state enterprises through profit, turnover, and payroll taxes (see, e.g., Martinez-Vazquez and McNab 2000). This concentration of taxes in a relatively small number of state enterprises, plus the fact that funds were channeled primarily through the state banking system, meant that tax compliance in socialist states was quite high by world standards (Kodrzycki and Zolt 1994, Tanzi and Tsibouris 2000). Liberalization of economic activity and privatization meant that states had to reform tax policy, replacing turnover taxes with a VAT and reforming existing profit, payroll, and personal-income taxes (Hemming, Cheasty, and Lahiri 1995). No less importantly, states were obligated to fundamentally restructure their systems of tax administration, a task hindered by state collapse and civil strife in much of the postcommunist world (Ebrill

and Havrylyshyn 1999).¹¹ Finally, the degree to which new tax systems could be effective was dependent on progress in modernizing corporate accounting systems, to this day an incomplete process in many postcommunist countries (e.g., Gorsky 2001). In the absence of complete tax reform, an entire economy has been built around tax evasion in much of the postcommunist world, with by-now well-established procedures for evading taxes at little cost (Yakovlev 2000).

Table 1 shows that the challenge of collecting tax revenues has been greater in some states than others.¹² Overall, the high-reform states of eastern Europe and the Baltics have done a better job of reforming their tax systems and maintaining tax capacity, as well as pursuing economic and political reforms more generally. Among the former Soviet republics, Belarus is the exception that proves the rule: having engaged in almost no economic or political reform, it has been able to continue extracting taxes from the economy in a way that other postsoviet states have not.¹³

TABLE 1

This section examines the impact of taxability on government support for firms in post-communist countries, concentrating on three key implications of the model presented in the previous section: 1) when individuals in the recipient sector value transfers more than taxpayers value post-tax profits, or when public goods are valued more than the profits used

¹¹Russia's federal system has also created perverse incentives to undercollect taxes. See Treisman (1999).

¹²Effective tax rates have been studied in a more systematic way by Schaffer and Turley (2000), who compare yields for various taxes across postcommunist countries, and Ivanenko (2001), who focuses on Russia.

¹³On this, see World Bank (2002, pp. 46-48).

to pay for them, then politicians will have an incentive to disproportionately support highly taxable business activity (Propositions 3 and 9); 2) the allocation of political support across sectors is independent of the size of the population receiving redistributive transfers (Proposition 5); 3) the degree to which highly taxable economic activity is favored is decreasing in the overall level of taxability in the country (Propositions 6 and 9).

We test these propositions using data from the 1999 World Bank/EBRD Business Environment and Enterprise Performance Survey (BEEPS). Through the BEEPS project, a total of 4104 firms in twenty-six countries were surveyed on various aspects of government-business relations.¹⁴ The empirical work in this paper uses data from twenty-three of those twenty-six countries. Firms in Bosnia-Herzegovina and the semi-autonomous Serb Republic in Bosnia were not included since the long war in those two entities makes comparisons with other postcommunist countries difficult, while Turkey was dropped because it is not a postcommunist country. In all, the dataset comprises 3762 firms in the countries listed and characterized in Table 1. Gehlbach (2003a) provides summary statistics for various characteristics of these firms.

Firms surveyed through the BEEPS project were queried on a number of features of business-state relations, including the degree of revenue reporting to tax authorities. On average, managers replied that a “typical firm in [their] area of activity” reports 80 percent of its revenues to tax authorities, with fully two-thirds of firms indicating some degree of

¹⁴For details about the survey and its implementation, see Hellman, Jones, Kaufmann, and Schankerman (2000).

tax evasion. In the empirical work below, we use revenue reporting as a proxy for the taxability of the firm. Gehlbach (2003a) defends this assumption at some length, showing that the covariation of this measure with sector and country and residence accords with publicly available information on tax compliance by sector and country. Further, we consider the impact of state ownership on government support of business activity, as state-owned enterprises are “taxable” not only through taxation but also by virtue of the fact that the state may extract profits as dividends or by compelling state firms to provide goods and services that might otherwise be paid for out of state funds.

Further, firm managers were asked to report on various aspects of government “support” (or lack thereof) for their business activity. In the regressions reported in this paper, six separate variables are used as indicators of government support for business activity. All variables are scaled such that a higher response indicates more support. Two of the six variables measure bribe payment: the percent of revenues *not* paid as bribes to public officials, and a similar measure where the proportion of bribes paid to tax or customs officials has been subtracted out, since our key independent variable is revenue reporting and firms might pay bribes to avoid tax payments. Other variables capture other elements of government-business relations: the percent of management time *not* spent with government officials, the extent to which firms have the opportunity to appeal administrative violations to higher authorities, the level of contract and property-rights enforcement, and a subjective measure of the degree to which local governments are helpful.

Table 2, which is reprinted from Gehlbach (2003a), examines the first of three key implications of the model presented in Section 2. When individuals in the recipient sector attach greater political salience to government transfers than do individuals in active sectors to post-tax profits ($\gamma_R > \gamma$), or when a public good is provided such that its marginal social benefit is greater than its marginal social cost ($\alpha > 1$), politicians will have an incentive to disproportionately support high-taxability sectors. A reasonable guess is that these two conditions are met, and Table 2 shows that firms reporting more revenues are indeed systematically favored over those reporting less. Controlling for a variety of firm characteristics in OLS and ordered-probit regressions, firms reporting more revenues pay less in bribes, spend less time with government officials, have more opportunity to appeal administrative violations, are more likely to have their contracts and property rights enforced, and are more likely to say that local governments are helpful.¹⁵ This effect is very precisely estimated for all six measures of government support, and marginal effects are substantial.¹⁶

TABLE 2

Further, for four of the six measures of government support, state ownership is significantly associated with better treatment by government officials, even after controlling for the proportion of revenues reported. The likely explanation is that state firms are more

¹⁵Gehlbach (2003a) addresses potential concerns about direction of causality and omitted-variable bias in these regressions.

¹⁶Marginal effects are calculated as the derivative of the probability of a given response with respect to a variable for proportion of revenues reported, and the discrete change in probability for a change in value from 0 to 1 for state ownership, in each case evaluated as the average effect across individuals in the sample (rather than the effect at the mean value of the right-hand-side variables).

“taxable” in the sense that profits can be extracted as dividends or other non-tax payouts. The one exception to this general pattern - state firms report spending more, not less, time with government officials - makes sense: managers must spend time with the firm’s owners, whoever they are.

While consistent with the model discussed above, the prediction that the government will discriminate against less-taxable firms can also be derived from a simpler model of a revenue-maximizing politician. More specific to the model in this paper are the arguments that the degree to which high-taxability firms are favored is independent of the size of the recipient population and is decreasing in the overall level of taxability in a country. Tables 3 and 4 report the results of regressions where these propositions are tested, interacting the proportion of revenues reported by the firm to tax authorities with the proportion of the population over age 65 and the proportion of GDP collected as taxes by all levels of government of the country in which the firm resides, respectively.¹⁷ (Revenue reporting is also interacted with the 1999 EBRD Average Transition Indicator for that country to control for the possibility that revenue hiding matters less in high-tax countries simply because those countries are more likely to have implemented economic reforms.) For reasons that will be clear shortly, Table 3 reports results for the subsample of firms in countries rated as “free” according to their political rights and civil liberties by the nongovernmental organization

¹⁷Country dummies, which are included in the regressions reported in Table 2, are dropped from all subsequent regressions since each country represented in the dataset has a unique proportion of GDP collected as taxes.

Freedom House, while Table 4 presents results for firms in countries rated as “partially free” or “not free.”

TABLE 3

TABLE 4

For almost every measure of government support in both subsamples of firms, the interaction of revenue hiding with the proportion of the population over age 65 is not significantly different from zero. Thus, given the data available, we cannot reject the hypothesis that the allocation of support across sectors is independent of the size of the recipient population, as predicted by Proposition 5. Only for one of the measures of bribe payment for the subsample of firms in “free” countries can we reject the hypothesis of no effect.

Further, Tables 3 and 4 show that the proposition that high-taxability firms will be less likely to be favored in high-tax countries fares quite well for the subsample of firms in countries rated as “free,” but not for firms located in countries rated as “partially free” or “not free.” For all six measures of government support, the degree to which revenue reporting is a predictor of government support is decreasing in the proportion of GDP collected as tax revenues by all levels of government, and for four of those six measures the estimated coefficient on the interaction term is statistically significant from zero at the five percent level.¹⁸ In contrast, there is no support for the proposition that country tax capacity

¹⁸The model in Section 2 suggests two possible sources of omitted-variable bias in these regressions. First, it is possible that public goods or redistributive transfers are valued less in high-tax countries, i.e. that α or γ_R are lower in countries collecting more tax revenues. Obviously, these variables are difficult to observe directly, but there seems little reason *a priori* to suspect that they vary systematically across countries. If

influences the degree to which revenue reporting matters in “partially free” and “not free” countries. For five of the six regressions reported in Table 4, the coefficient on the interaction term is not significantly different from zero, and for the sixth the sign on the coefficient is inconsistent with the theory being tested.

Nonetheless, when the interaction term is dropped and government support is simply regressed on revenue reporting and covariates as in Table 2, one obtains the same result for the subsample of firms in “partially free” or “not free” countries as for the whole sample: the more a firm reports hiding revenues from tax authorities, the less support it receives from government officials. In other words, for those countries with poorly developed political rights and civil liberties, the empirical results of this section are inconsistent with the electoral-competition model presented in Section 2, but are consistent with a simpler model of a revenue-maximizing politician who discriminates between sectors based on their taxability. In a sense, this is not surprising: the electoral-competition model of this paper

anything, it is plausible that in the postcommunist world public goods and transfers are provided with less waste (and thus more valued) in countries with more capacity to collect tax revenues, since those countries will have generally effective state institutions.

Second, it is conceivable that the ratio of high-taxability to low-taxability firms, $\frac{N_H}{N_L}$, is smaller in countries with high tax capacity; according to Proposition 4, this would encourage more support for low-taxability firms in those countries. In principle, we could control for this effect by interacting revenue reporting with the ratio of employment in firms more likely to report revenues to that in firms less likely to do so, e.g. the ratio of employment in large vs. small enterprises. In practice, such data are not collected in every country, and (especially with respect to small-enterprise employment) where collected do not always use the same definitions. World Bank (2002, p. 41) reports share of employment in small enterprises for nine postcommunist countries, five of which are rated “free” by Freedom House. For the nine countries reported, variation within “freedom” group is in fact very small, while variation across groups is large. Moreover, the correlation between small-enterprise employment and tax capacity within the “free” group is *negative*, not positive as would need to be the case for omission of the variable $\frac{N_H}{N_L}$ to bias results in the observed direction.

assumes that democratic politics function in more-or-less “normal” fashion. To the extent that this assumption fails to hold (as it likely does in countries with incomplete political rights and civil liberties), one should not expect the model’s predictions to necessarily accord with empirical reality. Politicians in less democratic countries may be motivated by revenue concerns for nonelectoral reasons, while the desire to be reelected dominates the calculus of support for politicians in more democratic states.

4. Conclusion

This paper has stressed the electoral incentive of politicians to support business activity in an environment in which economic sectors differ according to their taxability. In so doing, the paper expands upon a basic intuition: when politicians care about taxes, when supporting business activity is costly to the politician, and when sectors differ according to their taxability, then politicians will have an incentive to allocate support for business activity unevenly across sectors. Focusing on the electoral incentive to provide support produces a number of predictions that do not necessarily follow from a model where the politician is motivated by revenue concerns for other reasons: the allocation of support depends on the degree to which transfers and public goods are valued by voters, and on the overall level of taxability across sectors, but not on the size of the population receiving transfers. Empirical analysis of survey data from postcommunist countries suggests that the model performs better in more democratic states than less democratic ones.

What distinguishes electoral incentives from other incentives to allocate support for economic activity based on the taxability of that activity? Why should we expect the pattern of support to look different in countries with strong democratic institutions than in countries with weaker or nonexistent democracies? Perhaps the key point is that when politicians vie for votes, support of one sector is a substitute for support of another in the following sense: an increase in the relative electoral return from supporting one sector results in a reallocation of support towards that sector and away from the other, even if absolute electoral returns have increased in both sectors. Thus, for example, as Proposition 6 predicts and the data suggest, greater overall taxability implies less support of highly taxable sectors, and more support of less taxable sectors. In contrast, when politicians have nonelectoral incentives to support economic activity, such as the desire to skim off tax revenues for personal use, higher taxability in both sectors can lead to greater support for each sector, as the politician reacts to the possibility of retaining a greater share of the proceeds by increasing his support for each type of economic activity. This distinction arises from the fact that total electoral returns are often capped at some level (in this paper due to the equilibrium condition that voters are not fooled by the politician’s attempt to appear more competent), whereas nonelectoral returns to increasing tax revenues typically will not be.¹⁹

¹⁹Perhaps the easiest way of seeing this is to consider a crude model in which an incumbent politician “buys” votes through tax revenues, which are dependent on his support for two sectors which differ in their taxability. Let $T_L e_L + T_H e_H$ be the percentage vote in favor of the incumbent, R the returns from winning reelection, and $c(e_L) + c(e_H)$ the cost of support. Since the politician gets no additional utility from winning a supermajority, he will provide either zero support or just enough support to win reelection, i.e. such that $T_L e_L + T_H e_H = 50$. The only question in the latter case is what allocation of support most cheaply provides the needed vote total. Thus, an equal increase in both T_L and T_H results in a reallocation of support away

Beyond any theoretical interest, the difference in government behavior implied by comparing electoral and nonelectoral models has an important policy consequence. If (local) politicians are motivated primarily by differences in relative returns, then the best policy by a (central) government might be to keep tax rates low but encourage tax authorities to collect taxes equally across different sectors. On the other hand, if it is absolute returns that matter, institutions such as local government ownership that provide high relatively levels of taxability may be optimal.

In developing the arguments in this paper, a number of simplifying assumptions were made. Most significantly, factors of production were assumed not to be mobile across sectors. In fact, as shown in Gehlbach (2002), factor mobility can exaggerate the impact of differences in taxability, as the size and taxability of a sector encourage government support, which in turn encourages factors to migrate to that sector, etc. A natural extension of the model in this paper would be to consider the impact of factor mobility in the present electoral context.

Second, the empirical results in Section 3 suggest that the model might be generalized to allow for differences in the degree to which elections are important to political survival. Such a generalization could demonstrate more precisely when one would expect the electoral incentives in the current model to dominate.

from the low-taxability towards the high-taxability sector. In contrast, a ruler who has access to the treasury for personal use, and who derives utility equal to $T_{LeL} + T_{HeH}$ from the support of taxable activity, will provide more support for each sector, the higher is overall taxability.

Economists will recognize the resemblance of the electoral problem to the derivation of Hicksian demand, and of the revenue-maximization problem to the derivation of Marshallian demand.

Finally, the model might be extended to include nonelectoral incentives to increase tax revenues, including the desire to use government funds for personal use or aggrandizement. Such incentives may interact in subtle ways with the electoral pressures present in this model, as the availability of government funds for personal use decreases the importance voters attach to competence (much as taxability does for active-sector voters in this paper), while simultaneously increasing the desire of politicians to be reelected.

5. Appendix

Proof of Proposition 1:

Focus on e_{L1} ; the proof for e_{H1} is analogous. Assumption 1 says that voters will have the following beliefs about the type they are facing, given observed performance k_{L1} and beliefs about the action taken by the politician \tilde{e}_{L1} :

$$\begin{aligned}
 \tilde{\theta}_L &= -a \text{ if } k_{L1} < \tilde{e}_{L1} - a \\
 &= k_{L1} - \tilde{e}_{L1} = e_{L1} + \theta_L - \tilde{e}_{L1} \text{ if } k_{L1} \in [\tilde{e}_{L1} - a, \tilde{e}_{L1} + a] \\
 &= a \text{ if } k_{L1} > \tilde{e}_{L1} + a
 \end{aligned} \tag{5.1}$$

Anticipating this, the politician can formulate his probability of winning, i.e. $\Pr(Z_L N_L \tilde{\theta}_L + Z_H N_H \tilde{\theta}_H \geq 0)$. Taking beliefs about the politician's choice of support \tilde{e}_{L1} for the low-taxability sector and competence $\tilde{\theta}_H$ in the high-taxability sector for the moment as given, $\Pr(Z_L N_L \tilde{\theta}_L + Z_H N_H \tilde{\theta}_H \geq 0)$ can be expressed for $e_{L1} \leq \tilde{e}_{L1}$ as:

$$\int_{-a}^{-a+\tilde{e}_{L1}-e_{L1}} I(-a \geq -\frac{Z_H N_H}{Z_L N_L} \tilde{\theta}_H) f(\theta_L) d\theta_L + \int_{-a+\tilde{e}_{L1}-e_{L1}}^a I(\theta_L + e_{L1} - \tilde{e}_{L1} \geq -\frac{Z_H N_H}{Z_L N_L} \tilde{\theta}_H) f(\theta_L) d\theta_L \tag{5.2}$$

where $I(\cdot)$ is the indicator function, which takes a value of one if the statement is true, and zero otherwise. The first term of this expression represents observations of k_{L1} off the equilibrium path, i.e. $k_{L1} < \tilde{e}_{L1} - a$, the second observations on the equilibrium path. Since

$\tilde{\theta}_L = -a$ if $k_{L1} < \tilde{e}_{L1} - a$, it will be true that $Z_L N_L \tilde{\theta}_L + Z_H N_H \tilde{\theta}_H \geq 0$ for all observations off the equilibrium path iff $-a \geq -\frac{Z_H N_H}{Z_L N_L} \tilde{\theta}_H$. In contrast, for observations on the equilibrium path, $\tilde{\theta}_L = e_{L1} + \theta_L - \tilde{e}_{L1}$, implying that the politician will win iff $\theta_L + e_{L1} - \tilde{e}_{L1} \geq -\frac{Z_H N_H}{Z_L N_L} \tilde{\theta}_H$.

Thus, we can express (5.2) in terms of realizations of the random variable $\tilde{\theta}_H$. (Recall that perceived competence $\tilde{\theta}_H$ is a function of actual competence θ_H , which is a random variable, and that θ_L and θ_H are distributed independently.) For $\tilde{\theta}_H \geq \frac{Z_L N_L}{Z_H N_H} a$, the indicator function takes on a value of one for all realizations of θ_L in both the first and second terms in (5.2), implying that for $\tilde{\theta}_H \geq \frac{Z_L N_L}{Z_H N_H} a$ the politician wins with probability equal to one. In contrast, if $\tilde{\theta}_H < \frac{Z_L N_L}{Z_H N_H} a$, then the indicator function in the first term equals zero, and the statement in the second term will be true only for $\theta_L \geq \tilde{e}_{L1} - e_{L1} - \frac{Z_H N_H}{Z_L N_L} \tilde{\theta}_H$. Rewriting (5.2) in terms of realizations of $\tilde{\theta}_H$, we have:

$$\int_{\tilde{\theta}_H < \frac{Z_L N_L}{Z_H N_H} a} [1 - F_{\theta_L}(\tilde{e}_{L1} - e_{L1} - \frac{Z_H N_H}{Z_L N_L} \tilde{\theta}_H)] f(\tilde{\theta}_H) d\tilde{\theta}_H + \int_{\tilde{\theta}_H \geq \frac{Z_L N_L}{Z_H N_H} a} 1 \cdot f(\tilde{\theta}_H) d\tilde{\theta}_H \quad (5.3a)$$

where for the sake of clarity we denote the cdf of θ_L as F_{θ_L} . For realizations of $\tilde{\theta}_H$ sufficiently low, the probability of winning is strictly less than one. However, for high realizations of $\tilde{\theta}_H$, even very low competence in the low-taxability sector will not keep the politician from winning.

Similarly, we can derive $\Pr(Z_L N_L \tilde{\theta}_L + Z_H N_H \tilde{\theta}_H \geq 0)$ for $e_{L1} \geq \tilde{e}_{L1}$ as:

$$\int_{\tilde{\theta}_H < -\frac{Z_L N_L}{Z_H N_H} a} 0 \cdot f(\tilde{\theta}_H) d\tilde{\theta}_H + \int_{\tilde{\theta}_H \geq -\frac{Z_L N_L}{Z_H N_H} a} [1 - F_{\theta_L}(\tilde{e}_{L1} - e_{L1} - \frac{Z_H N_H}{Z_L N_L} \tilde{\theta}_H)] f(\tilde{\theta}_H) d\tilde{\theta}_H \quad (5.4)$$

Taken together, (5.3a) and (5.4) define a continuous, differentiable function of e_{L1} . Taking the derivative of this function and applying the equilibrium condition that $\tilde{e}_{L1} = e_{L1}$, as well as the equilibrium condition that $\tilde{\theta}_H = \theta_H$ (since $\tilde{\theta}_H = e_{H1} + \theta_H - \tilde{e}_{H1}$, and in equilibrium $\tilde{e}_{H1} = e_{H1}$), we have:

$$\begin{aligned} \frac{\partial \Pr(Z_L N_L \tilde{\theta}_L + Z_H N_H \tilde{\theta}_H \geq 0)}{\partial e_{L1}} &= \int_{\theta_H \in [-\frac{Z_L N_L}{Z_H N_H} a, \frac{Z_L N_L}{Z_H N_H} a]} f(-\frac{Z_H N_H}{Z_L N_L} \theta_H) f(\theta_H) d\theta_H \\ &= \int f(-\frac{Z_H N_H}{Z_L N_L} \theta_H) f(\theta_H) d\theta_H \\ &= \bar{f}(-\frac{Z_H N_H}{Z_L N_L}) \end{aligned} \quad (5.5)$$

where we recall that θ_L and θ_H are identically distributed. The second equality follows from the fact that θ_H is defined over a support of $[-a, a]$, so that integrating over $\theta_H \in [-\frac{Z_L N_L}{Z_H N_H} a, \frac{Z_L N_L}{Z_H N_H} a]$ does not in any way limit the realizations of θ_H for which $f(-\frac{Z_H N_H}{Z_L N_L} \theta_H) > 0$, and the third equality makes use of the definition of \bar{f} . Multiplying by R and setting this equal to the derivative of the cost function defines the unique level of support for the low-taxability sector. ■

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Table 1: Country Characteristics

| | 1999 General Government Revenue as Percent of GDP | 1999 EBRD Average Transition Indicator | 1999 Percent of Population Over 65 | 1999 Freedom House Rating | Firms in BEEPS Sample |
|--|--|---|---|--------------------------------------|----------------------------------|
| <u>Eastern Europe and Baltics</u> | | | | | |
| Albania | 21.3 | 2.5 | 7 | Partially Free | 163 |
| Bulgaria | 39.8 | 2.9 | 16 | Free | 130 |
| Croatia | 42.8 | 3.0 | 15 | Partially Free | 127 |
| Czech Republic | 38.7 | 3.4 | 14 | Free | 149 |
| Estonia | 36.4 | 3.5 | 14 | Free | 132 |
| Hungary | 39.1 | 3.7 | 15 | Free | 147 |
| Latvia | 40.1 | 3.1 | 15 | Free | 166 |
| Lithuania | 31.7 | 3.1 | 14 | Free | 112 |
| Macedonia | 38.0 | 2.8 | 10 | Partially Free | 136 |
| Poland | 40.2 | 3.5 | 12 | Free | 246 |
| Romania | 33.3 | 2.8 | 14 | Free | 125 |
| Slovakia | 39.7 | 3.3 | 12 | Free | 138 |
| Slovenia | 43.6 | 3.3 | 15 | Free | 125 |
| Average EE and Baltics | 37.3 | 3.1 | 13 | | |
| <u>CIS</u> | | | | | |
| Armenia | 20.3 | 2.7 | 10 | Partially Free | 125 |
| Azerbaijan | 18.9 | 2.2 | 7 | Partially Free | 137 |
| Belarus | 45.7 | 1.5 | 13 | Not Free | 132 |
| Georgia | 15.4 | 2.5 | 13 | Partially Free | 129 |
| Kazakhstan | 17.4 | 2.7 | 8 | Not Free | 147 |
| Kyrgyzstan | 24.0 | 2.8 | 6 | Partially Free | 132 |
| Moldova | 27.4 | 2.8 | 10 | Partially Free | 139 |
| Russia | 35.1 | 2.5 | 13 | Partially Free | 552 |
| Ukraine | 33.7 | 2.4 | 14 | Partially Free | 247 |
| Uzbekistan | 30.4 | 2.1 | 5 | Not Free | 126 |
| Average CIS | 26.8 | 2.4 | 10 | | |

Notes: Countries included are those represented in the BEEPS dataset (less Turkey, Bosnia-Herzegovina, and the Serb Republic in Bosnia). Government revenue figures are imputed from expenditure and balance data in EBRD (2001). EBRD transition indicators are from EBRD (1999). Percent of population over 65 is from *The World Factbook 2000*. Freedom House ratings are from Freedom House (2002).

Table 2: Effect of Revenue Reporting and Ownership on Government Support

(Significance levels: 10% - *; 5% - **; 1% - ***)

OLS Regressions

| | Percent of Revenues <u>Not Paid as Bribes</u> | | Percent of Revenues <u>Not Paid as Non-Tax Bribes</u> | | Percent of Management Time <u>Not Spent with Government Officials</u> | |
|---------------------------------|--|-------------------------------------|--|-------------------------------------|--|-------------------------------------|
| | <u>Estimated coefficient</u> | <u>Robust std. error</u> | <u>Estimated coefficient</u> | <u>Robust std. error</u> | <u>Estimated coefficient</u> | <u>Robust std. error</u> |
| Proportion of revenues reported | 2.72*** | 0.43 | 1.98*** | 0.32 | 3.15*** | 1.01 |
| State-owned enterprise | 0.53** | 0.22 | 0.46*** | 0.15 | -3.30*** | 0.80 |
| Log employment | 0.37*** | 0.07 | 0.28*** | 0.05 | -0.20 | 0.17 |
| Degree of competition | -0.26* | 0.14 | -0.17* | 0.10 | 0.49 | 0.40 |
| N | 2685 | | 2416 | | 3114 | |
| R ² | .128 | | .108 | | .101 | |

Ordered-Probit Regressions

| | Opportunity to Appeal <u>Administrative Violations</u> | | Contracts and Property <u>Rights Enforced</u> | | Local Government <u>Helpful</u> | |
|---------------------------------|---|-------------------------------------|--|-------------------------------------|--|-------------------------------------|
| | <u>Estimated coefficient</u> | <u>Robust std. error</u> | <u>Estimated coefficient</u> | <u>Robust std. error</u> | <u>Estimated coefficient</u> | <u>Robust std. error</u> |
| Proportion of revenues reported | 0.36*** | 0.09 | 0.25*** | 0.08 | 0.26*** | 0.08 |
| State-owned enterprise | 0.06 | 0.07 | 0.32*** | 0.06 | 0.27*** | 0.06 |
| Log employment | 0.05*** | 0.02 | 0.07*** | 0.01 | 0.11*** | 0.01 |
| Degree of competition | -0.02 | 0.04 | -0.02 | 0.03 | -0.06* | 0.04 |
| N | 2903 | | 3401 | | 3329 | |
| Maximized log likelihood | -4935.3 | | -5370.8 | | -4658.5 | |
| Marginal effects | Always (Pr = .10) | Mostly (Pr = .16) | Fully Agree (Pr = .06) | Agree in Most Cases (Pr = .15) | Very Helpful (Pr = .04) | Mildly Helpful (Pr = .18) |
| - Prop. of revenues reported | .06 | .05 | .03 | .04 | .02 | .05 |
| - State ownership | .01 | .01 | .04 | .05 | .03 | .05 |

Notes: Constant and sector, country, and town-size dummies included in all regressions. For ordered-probit regressions, probability is predicted probability averaged across all individuals, and marginal effect is average derivative for proportion of revenues reported and average discrete change for state ownership.

Table 3: Interaction of Revenue Reporting with Tax Capacity and Proportion of Population Over 65 (“Free” Countries)

(Significance levels: 10% - *; 5% - **; 1% - ***)

OLS Regressions

| | Percent of Revenues <u>Not Paid as Bribes</u> | | Percent of Revenues <u>Not Paid as Non-Tax Bribes</u> | | Percent of Management Time <u>Not Spent with Government Officials</u> | |
|---------------------------------------|--|-------------------------------------|--|-------------------------------------|--|-------------------------------------|
| | <u>Estimated coefficient</u> | <u>Robust std. error</u> | <u>Estimated coefficient</u> | <u>Robust std. error</u> | <u>Estimated coefficient</u> | <u>Robust std. error</u> |
| Proportion of revenues reported | 39.64*** | 14.82 | 11.75* | 1.90 | 92.87* | 48.21 |
| Revenues reported*popn over 65 | -70.40* | 37.84 | -49.00 | 34.67 | -86.74 | 162.47 |
| Revenues reported*tax capacity | -65.62*** | 25.45 | -31.64* | 19.11 | -76.66 | 71.45 |
| Revenues reported*reform | -1.00 | 2.12 | -0.66 | 1.96 | -15.04* | 7.71 |
| Proportion of population over 65 | 73.68** | 33.84 | 54.76* | 31.22 | 101.76 | 140.42 |
| Country tax capacity | 61.57*** | 23.55 | 28.57 | 17.68 | 108.66* | 64.51 |
| Country reform | 2.07 | 1.88 | 1.56 | 1.76 | 11.28* | 6.62 |
| State-owned enterprise | 0.35 | 0.22 | 0.26 | 0.20 | -1.47 | 1.05 |
| Log employment | 0.42*** | 0.08 | 0.37*** | 0.08 | -0.22 | 0.21 |
| Degree of competition | -0.36*** | 0.13 | -0.26** | 0.12 | 0.09 | 0.57 |
| N | | 970 | | 872 | | 1165 |
| R ² | | .130 | | .129 | | .032 |

Ordered-Probit Regressions

| | <u>Opportunity to Appeal Administrative Violations</u> | | <u>Contracts and Property Rights Enforced</u> | | <u>Local Government Helpful</u> | |
|---------------------------------------|---|-------------------------------------|--|-------------------------------------|--|-------------------------------------|
| | <u>Estimated coefficient</u> | <u>Robust std. error</u> | <u>Estimated coefficient</u> | <u>Robust std. error</u> | <u>Estimated coefficient</u> | <u>Robust std. error</u> |
| Proportion of revenues reported | -0.59 | 4.35 | 7.36** | 3.50 | 9.85** | 4.24 |
| Revenues reported*popn over 65 | 9.41 | 13.54 | -4.92 | 12.53 | 0.17 | 13.06 |
| Revenues reported*tax capacity | -2.59 | 7.01 | -8.99* | 5.01 | -15.44** | 6.96 |
| Revenues reported*reform | 0.23 | 0.78 | -0.84 | 0.70 | -1.04 | 0.70 |
| Proportion of population over 65 | -3.98 | 11.63 | 6.61 | 10.87 | -4.43 | 11.44 |
| Country tax capacity | 4.93 | 6.22 | 8.04* | 4.31 | 13.33** | 6.20 |
| Country reform | 0.36 | 0.68 | 1.51** | 0.60 | 2.15*** | 0.62 |
| State-owned enterprise | 0.26** | 0.12 | 0.51*** | 0.09 | 0.47*** | 0.11 |
| Log employment | 0.02 | 0.02 | 0.05** | 0.02 | 0.11*** | 0.02 |
| Degree of competition | 0.00 | 0.06 | -0.01 | 0.05 | -0.07 | 0.06 |
| N | | 1022 | | 1299 | | 1257 |
| Maximized log likelihood | | -1714.7 | | -2040.7 | | -1702.4 |

Notes: Private firms omitted category. Constant and sector and town-size dummies included in all regressions.

Table 4: Interaction of Revenue Reporting with Tax Capacity and Proportion of Population Over 65 (“Partially Free” and “Not Free” Countries)

(Significance levels: 10% - *; 5% - **; 1% - ***)

OLS Regressions

| | Percent of Revenues <u>Not Paid as Bribes</u> | | Percent of Revenues <u>Not Paid as Non-Tax Bribes</u> | | Percent of Management Time <u>Not Spent with Government Officials</u> | |
|---------------------------------------|--|-------------------------------------|--|-------------------------------------|--|-------------------------------------|
| | <u>Estimated coefficient</u> | <u>Robust std. error</u> | <u>Estimated coefficient</u> | <u>Robust std. error</u> | <u>Estimated coefficient</u> | <u>Robust std. error</u> |
| Proportion of revenues reported | 13.40** | 6.32 | 7.61 | 4.72 | -17.08 | 13.77 |
| Revenues reported*popn over 65 | -35.59 | 23.74 | -6.13 | 17.27 | -74.48 | 48.26 |
| Revenues reported*tax capacity | 5.51 | 7.40 | 0.62 | 5.53 | 56.35*** | 14.43 |
| Revenues reported*reform | -2.99 | 2.78 | -1.87 | 2.02 | 5.02 | 6.37 |
| Proportion of population over 65 | 34.44* | 20.09 | 12.53 | 14.80 | 13.41 | 39.34 |
| Country tax capacity | 1.02 | 6.21 | -0.95 | 4.77 | -33.89*** | 10.88 |
| Country reform | 3.58 | 2.51 | 2.39 | 1.81 | 0.85 | 5.51 |
| State-owned enterprise | 0.53 | 0.34 | 0.46** | 0.22 | -4.27*** | 1.18 |
| Log employment | 0.35*** | 0.11 | 0.25*** | 0.08 | -0.25 | 0.25 |
| Degree of competition | -0.21 | 0.20 | -0.10 | 0.13 | 0.51 | 0.55 |
| N | | 1609 | | 1449 | | 1829 |
| R ² | | .105 | | .089 | | .066 |

Ordered-Probit Regressions

| | Opportunity to Appeal <u>Administrative Violations</u> | | Contracts and Property <u>Rights Enforced</u> | | Local Government <u>Helpful</u> | |
|---------------------------------------|---|-------------------------------------|--|-------------------------------------|--|-------------------------------------|
| | <u>Estimated coefficient</u> | <u>Robust std. error</u> | <u>Estimated coefficient</u> | <u>Robust std. error</u> | <u>Estimated coefficient</u> | <u>Robust std. error</u> |
| Proportion of revenues reported | 1.93 | 1.20 | 1.51 | 1.06 | 0.73 | 1.06 |
| Revenues reported*popn over 65 | 3.08 | 3.69 | 2.28 | 3.51 | 1.90 | 3.54 |
| Revenues reported*tax capacity | -0.80 | 1.30 | 1.40 | 1.24 | -0.94 | 1.25 |
| Revenues reported*reform | -0.69 | 0.48 | -0.80* | 0.45 | -0.20 | 0.44 |
| Proportion of population over 65 | -3.52 | 2.95 | -4.79* | 2.85 | 0.16 | 2.87 |
| Country tax capacity | 0.60 | 1.02 | -1.37 | 1.00 | 0.40 | 1.02 |
| Country reform | 0.09 | 0.39 | 0.14 | 0.37 | -0.33 | 0.37 |
| State-owned enterprise | -0.02 | 0.09 | 0.27*** | 0.08 | 0.23*** | 0.08 |
| Log employment | 0.05*** | 0.02 | 0.07*** | 0.02 | 0.12*** | 0.02 |
| Degree of competition | -0.06 | 0.05 | -0.07* | 0.04 | -0.06 | 0.04 |
| N | | 1771 | | 1978 | | 1949 |
| Maximized log likelihood | | -3035.8 | | -3242.0 | | -2796.6 |

Notes: Private firms omitted category. Constant and sector and town-size dummies included in all regressions.