Taxability and State Support of Economic Activity

by

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A dissertation submitted in partial satisfaction of the
requirements for the degree of
Doctor of Philosophy

in

Political Science and Economics:
Post-Communist Political Economy

in the

GRADUATE DIVISION
of the
UNIVERSITY of CALIFORNIA, BERKELEY

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Spring 2003

UMI Number: 3105218

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Abstract

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At the core of this dissertation is a simple idea: political actors, interested in tax revenues, have an incentive to support economic activity which is more taxable, i.e. activity from which the state can more easily extract revenues. A series of formal models explores the limitations and consequences of this argument.

The first set of models demonstrates the key role played by the commitment power of the state: economic actors have an incentive to hide revenues from the state when rulers are unable to commit to leaving behind a portion of unhidden production, and need to be compensated for forgoing that option when the state can commit. Given that some actors will find it easier to hide revenues than others, state support will typically favor economic activity which is more taxable. Application of these

models to the analysis of survey data suggests that business-state relations in the postcommunist world are characterized by commitment failures on the part of the state.

The second set of models takes the incentive of the state to support more taxable activity as given, exploring the consequences of this incentive when factors of production are mobile across sectors which differ in their taxability: political economies will organize themselves into equilibria where states support economic activity because resources are allocated to it, which in turn encourages that allocation. Such a mechanism, together with large differences in relative taxability across states, may have contributed to the development of a "great divide" in political-economic performance between Eastern Europe and the former Soviet Union.

While the first two sets of models assume a revenue-maximizing ruler, the third posits an elected politician for whom competence in supporting economic activity and producing tax revenues is important for reelection. In an electoral context, higher taxability does not unambiguously translate into more support. Rather, the degree to which taxability matters will depend on such institutional factors as the value that voters place on the goods and transfers provided by the state, and the overall tax capacity of the state. Analysis of survey data from postcommunist states implies that the electoral model fits best for those countries with strong democracies.

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Acknowledgments

A dissertation has only one name on it, but it is in fact a team project. In my case, I had two teams. My dissertation committee at UC Berkeley - Henry Brady, George Akerlof, George Breslauer, Matthew Rabin, and Jim Robinson - provided sound criticism, helpful comments, timely support, and the all-important "you should read this" at numerous junctures. My colleagues in Moscow for the past two years at the Centre for Economic and Financial Research (CEFIR) sat patiently through presentations in which I may at time have sounded like I was thinking out loud, and helped me to formulate many of the ideas in this dissertation over a cup of coffee or tea. Sergei Guriev, Konstantin Sonin, and Ekaterina Zhuravskaya in particular read multiple drafts of the chapters in this dissertation, each time providing many useful suggestions.

In Berkeley, Moscow, and elsewhere I also received useful feedback from Erik Berglof, John Earle, Guido Friebel, David Ralph, Gerard Roland, Alexandra Vacroux, Ksenia Yudaeva, and numerous others. Seminar and conference participants helped with comments and questions at CEFIR, SITE, Notre Dame, Harvard, Columbia, NYU, Yale, Wisconsin, Chicago, the 2002 APSE Conference on Public Sector Transition in St. Petersburg, the 2002 APSA annual meeting, the October 2002 workshop of the Project on Honesty and Trust in Budapest, and the 2003 MPSA Annual Meeting. Geraint Jones was of great help in providing answers to various questions about the BEEPS data.

Chapter 1

Introduction

In many parts of the world, economic activity is difficult without active state support. In such environments, poor protection of property rights, petty corruption, and bureaucratic inefficiency is the norm, and only the active intervention of senior state officials can provide an environment conducive to economic 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, economic development has been hampered by insecure property rights and the absence of an impartial, honest, and efficient bureaucracy. Corruption (Scheppele 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, for example, 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).[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 dissertation extends and complement this literature by emphasizing that the degree of state support of economic activity is determined in part by the *taxability* of economic activity, i.e. the ease with which the state can extract revenues from economic agents. Behind this general argument are two premises: that state officials are interested in tax revenues, and that it is easier for the state to extract revenues from

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[1]Bureaucratic 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.

some economic agents than from others. 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."

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-state relations, including the literatures on fiscal federalism, hybrid ownership forms in China, the "resource curse," and colonialism.[2]

This dissertation expands upon these insights by examining the conditions under which taxability will influence the provision of state support, as well as the consequences of such influence. In each of three chapters, a set of models is presented

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[2]The literature on 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.

to explore a particular feature of the taxability question, with data from a survey of firms in 23 postcommunist countries then brought to bear on the models.

In Chapter 2, a series of models is developed to demonstrate the key role played by the commitment power of the state: economic actors have an incentive to hide revenues from the state when rulers are unable to commit to leaving behind a portion of unhidden production, and need to be compensated for forgoing that option when the state can commit. Given that some actors will find it easier to hide revenues than others, state support will typically favor more taxable economic activity. Application of these models to the analysis of survey data finds patterns of revenue hiding and state support strongly suggestive of commitment failures in postcommunist states, and weakly so of a state which has the ability to commit, albeit only to an inefficient tax.

In Chapter 3, the interest of the state in collecting revenues is taken as a given. Rather than viewing economic actors in isolation, however, the models in this chapter consider the interaction of two sectors which differ in their taxability. When factors of production are mobile across sectors, political economies will organize themselves into equilibria where states support activity because resources are allocated to it, which in turn encourages that resource allocation. When resources and state support are organized in support of an "old" equilibrium, and the possibility of a "new," possibly more efficient equilibrium beckons, the relative taxability of the old and new sectors will determine the likelihood of such a shift. In the postcommunist world, such a

mechanism may have contributed to the creation of two general political-economic configurations: one in Eastern Europe where new economic activity is supported by the state and is common, and one in the former Soviet Union where such support is lacking and new businesses are rare.

In contrast to Chapter 3, the models in Chapter 4 take factor allocation as given, but develop a more realistic model of political behavior in a democratic setting characterized by disorganized special interests and incredible campaign promises. When tax revenues pay for transfers or public goods which are important to voters, and an incumbent politician's competence in supporting economic activity persists after an election, then politicians may have an incentive to provide more support to sectors which are more taxable. In particular, 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 (surprisingly) not on the number of recipients of government transfers. Analysis of survey data from postcommunist states implies that the electoral model fits best for those countries with strong democracies.

The focus in the models of Chapters 2 through 4 on taxability, state commitment, and organization of special interests helps us to understand the reach and limits of the arguments presented in this dissertation. Empirically, this dissertation draws on the experience of postcommunist Europe and Asia, a region in which the issues

discussed here may be especially salient. While information asymmetries between state and society hinder revenue collection in any state, the challenge of collecting revenues has been particularly severe for many postcommunist countries. Socialist states raised revenues primarily through profit, turnover, and payroll taxes collected from state-owned enterprises and funneled through the state banking system (see, e.g., Martinez-Vazquez and McNab 2000 or Tanzi and Tsibouris 2000). Privatization, liberalization, and the growth of the traditionally underdeveloped service sector following the collapse of communism necessitated the wholesale reform of tax policy (Hemming, Cheasty, and Lahiri 1995)) and recreation of tax-administration systems (Ebrill and Havrylyshyn 1999), a task still incomplete in much of the postsocialist world. In the absence of such reform, entire economies have developed around tax evasion (Yakovlev 2000). Table 1.1 demonstrates that the revenue challenge has been particularly great for the countries of the former Soviet Union, a point discussed at greater length in Chapter 3.

Further, the rulers of postcommunist states may have commitment problems to a greater degree than their counterparts in many other parts of the world. The now-familiar "ratchet effect" was first identified in the study of socialist economies (Weitzman 1980), with firms only just fulfilling the plan for fear of what they might be asked to do in the future if they demonstrated their true capacity. The legacy of the state's failure to commit to future planning targets may be generalized mistrust of any policy pronouncement, including promises to not raise tax rates once

firms "come out of the shadows." In more mature democracies, similar commitment problems may be mitigated by the presence of political parties, which by encouraging responsible behavior among their members enhance the party's reputation (Cox and McCubbins 1994.) However, reputations take time to develop, and most parties in the postcommunist world are new.

Finally, the legacy of totalitarianism in the postcommunist world has typically meant little articulation of special interests. The infamous "oligarchs" are the exception which proves the rule: in the absence of other political organization, a small set of business leaders has exerted undue influence on government policy in many postcommunist states. This dissertation can be viewed as a stylized representation of the remainder of the political arena: a state which finds it difficult to commit, interacting in an environment of great information asymmetry with economic actors who have failed to organize.

Table 1.1: Country Characteristics

	1999 General Government Revenue as Percent of GDP	1999 EBRD Average Transition Indicator	1999 EBRD Index of Large-Scale Privatization	1999 EBRD Index of Small-Scale Privatization	1999 Percent of Population Over 65	1999 Freedom House Rating	Firms in BEEPS Sample
Eastern Europe and Baltics							
Albania	21.3	2.5	2	4	7	Partially Free	163
Bulgaria	39.8	2.9	3	3+	16	Free	130
Croatia	42.8	3.0	3	4+	15	Partially Free	127
Czech Republic	38.7	3.4	4	4+	14	Free	149
Estonia	36.4	3.5	4	4+	14	Free	132
Hungary	39.1	3.7	4	4+	15	Free	147
Latvia	40.1	3.1	3	4	15	Free	166
Lithuania	31.7	3.1	3	4+	14	Free	112
Macedonia	38.0	2.8	3	4	10	Partially Free	136
Poland	40.2	3.5	3+	4+	12	Free	246
Romania	33.3	2.8	3-	4-	14	Free	125
Slovakia	39.7	3.3	4	4+	12	Free	138
Slovenia	43.6	3.3	3	4+	15	Free	125
Average EE and Baltics	**37.3**	**3.1**			**13**		
CIS							
Armenia	20.3	2.7	3	3+	10	Partially Free	125
Azerbaijan	18.9	2.2	2-	3+	7	Partially Free	137
Belarus	45.7	1.5	1	2	13	Not Free	132
Georgia	15.4	2.5	3+	4	13	Partially Free	129
Kazakhstan	17.4	2.7	3	4	8	Not Free	147
Kyrgyzstan	24.0	2.8	3	4	6	Partially Free	132
Moldova	27.4	2.8	3	3+	10	Partially Free	139
Russia	35.1	2.5	3+	4	13	Partially Free	552
Ukraine	33.7	2.4	2+	3+	14	Partially Free	247
Uzbekistan	30.4	2.1	3-	3	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).

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Chapter 2

Commitment

2.1 Introduction

Modern political economy has revisited and revised the theory of the state developed by the contract theorists of the seventeenth and eighteenth centuries. As in that earlier era, the state or sovereign is seen as providing security or some other public good that individuals cannot provide for themselves, and for which individuals are willing to enter into a social contract and surrender some portion of their property or liberties. North (1981, p. 23), for example, suggests in the modern theory's paradigmatic formulation that "the state trades a group of services, which we shall call protection and justice, for revenue."[1]

However, today's theorists - influenced by the vast literature on "transaction costs"

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[1]The revenue needs of the state have often motivated the assumption of state autonomy. See, e.g., Skocpol (1979), Tilly (1990), and various essays in Evans *et al* (1985).

inspired by Coase (1960) - are decidedly more skeptical than their forerunners of the scope for efficient bargaining between the state on the one hand, and individuals on the other.[2] The inherent problem with a contract to which the state is a party, of course, is that there is typically no third party to enforce the contract. "A state with sufficient coercive power to [enforce contract and property rights and provide public goods] also has the power to withhold protection or confiscate private wealth" (Greif et al 1994). This potential for ex-post opportunism on the part of the state implies that a "political Coase theorem," in which the state and private entities bargain to an efficient outcome, will often not apply (Acemoglu 2002; see also Robinson 1998).

Compounding this commitment problem is the fact that information asymmetries between state and society are likely to be large, especially in the context of revenue collection, where the cost to the state of fully ascertaining taxpayers' ability to pay and of monitoring compliance is prohibitive (Levi 1988).[3] In particular, if the state is unable to commit to leaving taxpayers with a portion of their income, then taxpayers may have an incentive to underreport revenues, even when hiding revenues from the state is costly.

One immediate implication is that a Pareto-improving trade of revenues for some publicly provided good might never be consummated. Another is that the extent to which state and society fall short of the Pareto frontier may depend on both the degree to which the state can commit and the nature of the information asymmetry

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[2]For a review of the "New Institutional Economics of the State," see Furubotn and Richter (2000, ch. 9).

[3]On "Information and the Coase Theorem," see Farrell (1987).

between state and society. In particular, when the public good provided by the state enhances economic productivity, the provision of that good may be influenced by the *taxability* of economic activity, i.e. the ease with which taxes may be collected from economic agents, as well as by the nature of commitment power.

This chapter explores these issues formally, presenting four variations on a model featuring a ruler and a firm. The former has the ability to provide support to the latter, but will do so only to the extent that she expects a return on her "investment." Since support enhances economic productivity, that return may come in the form of tax revenues collected following production. However, only revenues unhidden may be collected, so both the taxability of economic activity and the extent to which the state is able to commit will affect the provision of support.

As will be seen, in all but the most limiting scenario the state will have an incentive to provide more support to firms which are more taxable. Beyond this general result, however, the models vary widely in their predictions about the nature of revenue hiding and provision of state support. This variation is exploited in the analysis of data from a survey of firms in 23 postcommunist states. As discussed in Chapter 1, postcommunist countries are a particularly apt environment in which to explore the impact of taxability on state support of economic activity, as the information asymmetries that plague revenue collection in any corner of the world are particularly acute for postsocialist states, which may also suffer from serious commitment problems.

In emphasizing the conditions under which an efficient bargain between state and society may exist, as well as the consequences of the failure of state and society to agree to such a compact, this chapter differs substantially from much of the literature on institutions, which has typically focused on institutions which have evolved over time to minimize transaction costs.[4] Market and democracy in Eastern Europe and the former Soviet Union are too new, and the break with the previous system too sharp, to expect such institutions to have developed wholesale within a decade of the fall of communism.

This chapter also differs in that the evidence presented is quantitative rather than qualitative in nature. While both methods of empirical inquiry are important, there has been little statistical evidence to date of social-contract failures and their consequences.[5] As will be seen, firms across the postcommunist world exhibit patterns of revenue hiding and state support broadly consistent with a model in which the state cannot commit to leaving firms with a portion of their production, and moderately consistent with a model of commitment power but inefficiencies in taxation. In par-

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[4]In addition to the sources discussed above, see, e.g., Spruyt (1994), who shows how over the course of three centuries the sovereign territorial state won out over other forms of political organization "because it proved more effective at preventing defection by its members, reducing internal transaction costs, and making credible commitments to other units" (p. 527).

[5]That evidence which does exist is largely based on data at the level of political units. For example, Jin and Qian (1998) provide evidence that the presence of TVEs (which are more "taxable" than private firms since they are municipally owned) helps governments to satisfy their objectives of increasing government revenues, employment, and rural income. Zhuravskaya (2000), in contrast, examines commitment failures between levels of government, showing that the failure of regional governments in Russia to commit to a fixed level of revenue sharing with local governments leads to weak incentives for the latter to increase the tax base or provide public goods. Acemoglu, Johnson, and Robinson (2001) demonstrate that the choice of institutions in former European colonies is driven by historical circumstances related to the disease environment faced by early settlers, rather than by what would maximize income today.

ticular, firms which an outside observer might expect to be less taxable – small firms, firms in sectors dealing in cash, etc. – do indeed report higher levels of revenue hiding. Further, firms which hide are less likely to receive state support: they are more burdened by corruption and overregulation, are less able to appeal administrative violations to higher authorities, are less likely to have their contracts and property rights enforced, and are less likely to say that local governments are supportive in general.

In operationalizing state support in this way, this chapter abstracts from the web of agency relationships that make up any state. Perhaps the best way of thinking about state support as presented here is to picture a senior government official who cares about revenues (the "ruler" of the model), and who has some degree of control over the lower-level bureaucrats who come into contact with managers and entrepreneurs on a daily basis. The nature and degree of control this senior official exercises over subordinates will depend on the revenue importance of the firm, or of the sector if the senior official is unable to observe the behavior of individual firms. Thus, "support" means discouraging bureaucrats from asking for bribes, encouraging them to enforce contracts, etc. Alternatively, it is possible that for larger firms it is the mayor or governor himself who interacts most often with firm managers, with "support" implying either direct action (as when a governor intervenes in a court case to support one party over the other) or opportunity cost (as when a mayor foregoes a bribe that he could have taken in return for a service he was obligated to provide).

The chapter proceeds as follows. Section 2.2 develops the model. Section 2.3 describes the data used to test the predictions of the model, while Section 2.4 presents the main results of the empirical analysis. Section 2.5 concludes.

2.2 Theory

In this section, we consider variations on a general model of state support of economic activity, considering in turn four scenarios which differ according to the state's ability to commit to not taking all observable revenues from a firm following production; to whether or not state support is useful for production in the "informal," i.e. untaxable sector; and to whether or not taxation takes the form of a lump-sum transfer or a proportional tax on observable revenues. As we will see, state support will typically be increasing in the taxability of economic activity for all but the limiting case where the state can commit to extracting no more than a lump-sum tax and state support does not augment hidden production. The models differ substantially, however, in their predictions about the division of production between taxable and untaxable economic activity, a fact which will be useful in the empirical work which follows in the next section.

2.2.1 Model With No Commitment

Consider a model with two players: a ruler and a firm. The firm benefits from state support of its economic activity, which may come either in the form of a "helping hand" (as when the state enforces private contracts to which the firm is a party) or restraint of the state's "grabbing hand" (as when the ruler exercises control over rent-seeking bureaucrats).[6] In either case, provision of state support is costly to the ruler, so that the ruler will provide support only to the extent that she can expect a return on her investment. In this model, that return comes in the form of tax revenues. The model can thus be considered a stylized characterization of political-economic life in an institutional environment in which revenues are important to political leaders, and in which more direct means of influencing policy are unavailable. (Indeed, the model can be reconceptualized as a game between a ruler and an infinity of identical firms of mass 1. In that case, the inability of firms to more directly influence state policy may arise from collective-action problems, which may be especially important in the postcommunist countries considered in the empirical analysis below.)

Formally, the ruler chooses a level of state support $e \in [0, \infty)$, incurring a cost from that support of $c(e)$, where $c_e, c_{ee} > 0$. Simultaneously, the firm chooses the division of production between the "formal" (taxable) and "informal" (untaxable) sector, with only revenues in the former observable and hence potentially expropriable by the state. Let H be the proportion of production "hidden" in the untaxable sector. Further,

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[6]Shleifer and Vishny (1998) provide the helping-hand/grabbing-hand metaphor.

let production in the taxable sector be equal to e, and in the untaxable sector equal to k. In Sections 2.2-2.4 we consider both the possibility that state support has no effect on production in the untaxable sector (i.e. we consider a version of the model where k equals some exogenous value b), and that state support augments hidden production in the same way as it does unhidden production (i.e. $k = e$). However, the distinction is unimportant when the state cannot commit.

If the firm could costlessly hide revenues from the state, then given the ruler's lack of commitment power (we are looking for subgame-perfect Nash equilibria) the firm would choose to locate all production in the untaxable informal sector. In practice, however, any firm will bear some cost to hiding production, even if it is merely paying an accountant to maintain a second set of books. Further, this cost will vary according to the nature of economic activity. For example, it may be substantially more difficult for pipeline operators to hide revenues from the state than it is for restaurateurs. We capture these considerations by letting the cost to the firm of diverting production to the informal sector be equal to $k \cdot g(H, \alpha)$, where the exogenous parameter $\alpha \in (\alpha', \infty)$ reflects the degree to which hiding revenues is costly to the firm. We will refer to α as the "taxability" of economic activity. Scaling the cost of hiding by k says that for a given α and H, the per-unit cost of hiding production is independent of the scale of economic activity. This assumption will considerably ease the analysis to follow. (It should be noted that firms of different size may still differ in their ability to hide revenues, but that this difference is captured by the parameter α rather than k.)

In particular, let $g(H, \alpha)$ satisfy the following assumptions, where subscripts denote derivatives:

$$g_H, g_{HH} > 0 \tag{2.1}$$

$$\lim_{H \to 0} g_H = 0$$

$$g(0, \alpha) = 0$$

$$g_{H\alpha}, g_{HH\alpha} > 0$$

Assuming $g_{H\alpha}, g_{HH\alpha} > 0$ is equivalent to saying that at any level of revenue hiding H, the marginal cost to the firm of hiding additional revenues will be greater, and will increase at a faster rate, the higher is α. In all that follows below, we will focus on interior solutions to the model, which will exist so long as $g(H, \alpha)$ satisfies:

$$\forall \alpha \in (\alpha', \infty), \exists H' \in (0, 1) \text{ s.t. } g_H(H', \alpha) = 1 \tag{2.2}$$

Example 1 *The following function satisfies all assumptions placed on $g(H, \alpha)$:*

$$g(H, \alpha) = \frac{\alpha}{2} H^2, \text{ with } \alpha > 1$$

Following choice of e and H, production takes place in both the formal and informal sector, with only production in the former potentially taxable by the state. Given our assumptions above, total production in the taxable sector is equal to $(1 - H) e$, while in the untaxable sector it is equal to Hk.

After production, the ruler may extract any revenues in the formal sector as taxes. When the state is unable to commit to taking less than the total production of the

formal sector, the firm knows that it will keep only revenues hidden in the informal

sector. Thus, the firm's choice of H solves:

$$\max_{H} k \left[H - g \left(H, \alpha \right) \right] \tag{2.3}$$

For future reference, we will use the superscript NC to refer to the equilibrium in the

no-commitment case. The solution to (2.3) is $g_H \left(H^{NC}, \alpha \right) = 1$, which is independent

of k (and in particular, independent of e for the version of the model when $k = e$,

implying that H^{NC} is a dominant strategy). Our assumptions about the shape of

$g \left(H, \alpha \right)$ imply that $\frac{\partial H^{NC}}{\partial \alpha} < 0$, i.e. the more taxable is economic activity, the less the

firm will try to hide production from the state. For example, if small firms deal more

in cash, and thus find it easier to hide revenues from tax collectors, revenue hiding

will be inversely correlated with firm size.

In solving for the optimal level of state support, the ruler anticipates her desire

to fully take all unhidden revenues, implying the following maximization problem:

$$\max_{e} \left(1 - H \right) e - c(e) \tag{2.4}$$

Given the firm's dominant strategy, the optimal level of state support is given by

$c_e(e^{NC}) = 1 - H^{NC}$. Thus, the less the the the firm hides, i.e. the more taxable

is economic activity, the more support the state will provide. Following our earlier

example, the model thus implies that the state may have an incentive to provide more

support to large enterprises if they cannot hide revenues so easily as small firms.

These observations are formally stated in the following proposition.

Proposition 1 *In the model with no commitment, the unique equilibrium has H^{NC} and e^{NC} defined by:*

$$g_H\left(H^{NC}, \alpha\right) = 1$$

$$c_e(e^{NC}) = 1 - H^{NC}$$

Proof. Omitted. ∎

Example 2 *If $g\left(H, \alpha\right) = \frac{\alpha}{2} H^2$, with $\alpha > 1$, and $c(e) = \frac{1}{2} e^2$, then $H^{NC} = \frac{1}{\alpha}$ and $e^{NC} = 1 - \frac{1}{\alpha}$.*

It will be useful to compare the outcome in Proposition 1 to the first-best outcome. Assume in the version of the model where $k = b$ that $b < e'$, where e' is defined by $c_e\left(e'\right) = 1$. (No further assumption is needed for the version of the model with $k = e$.) Since revenue hiding is costly, and production in the informal sector is less productive than in the formal sector when the ruler provides the "full" level of support, the first-best outcome is given by $H^{FB} = 0$ and $c_e(e^{FB}) = 1$. Thus, two sources of inefficiency are present in the no-commitment case: the firm engages in costly revenue hiding, and the state provides less than the efficient level of support. In the following subsections, we examine the conditions under which one or both of these inefficiencies can be eliminated.

2.2.2 Model With Commitment – "de Soto" Case

When the ruler is unable to commit to leaving the firm with a share of its production in the formal sector, the firm hides revenues from the state, despite the destruction of wealth this causes. That in turn influences the degree to which the state supports economic activity, as the previous section demonstrated. Given these inefficiencies, it may be in the interest of the ruler to commit to leaving behind a portion of unhidden revenues and thus induce complete disclosure of economic activity by the firm.

To explore this possibility, we must be more precise about what constitutes hidden economic activity. One conceptualization, popularized by de Soto (1990) and subsequently adopted in much formal analysis (e.g. Johnson *et al* 1998, Roland and Verdier 1999), is that the "informal" sector exists in a world without such state services as contract enforcement and protection of property rights: rather than operating out of a store front, a trader sells his goods on the black market, invisible to the state and its agents. Despite its popularity, however, this assumption is strong: If the division of production between the "formal" and "informal" sectors merely reflects tax evasion within a single sphere of activity rather than the diversion of production to a different form of productive activity, then it is implausible to think that such state actions as contract enforcement have no impact on the profitability of "informal" economic activity. For example, a restaurant which cooks its books will have more to hide if the state cracks down on bribe-seeking fire inspectors, as will an oil firm

engaging in transfer pricing schemes if the state provides assistance in establishing foreign markets.

We begin, however, by assuming that the informal sector is truly informal, i.e. we assume $k = b$ using the notation above. Assume as before that $b < e^{FB}$. Further, to establish a benchmark, assume that the state can commit to a nondistortionary lump-sum tax conditional on state support e.

Examining Proposition 1, we observe that for the firm to want to fully report its revenues, it must be given at least as much as when it engages in optimal revenue hiding, i.e. the state must commit to leaving the firm with $b\left(H^{NC} - g\left(H^{NC}, \alpha\right)\right)$. Consider a commitment by the ruler to extract no more than $T(e)$, where $T(e)$ satisfies:

$$T(e) = \max\left[0, e - b\left(H^{NC} - g\left(H^{NC}, \alpha\right)\right)\right] \tag{2.5}$$

Note that this tax is conditional on the level of state support, not on the level of unhidden revenues. One example of such a tax is a user fee on government services. Another is a real-estate tax tied to the overall value of property in a community. Further below we consider the impact of a distortionary proportional tax on unhidden revenues.

As constructed, $T(e)$ provides the firm with as much as it would earn from hiding revenues so long as e is high enough, and leaves the ruler the residual claimant on unhidden revenues. Thus, it will be an equilibrium for the firm to choose $H^* = 0$, while the state provides the first-best level of support $e^* = e^{FB}$. Clearly, if ruler and

firm can coordinate on this equilibrium, then the ruler will want to commit to $T(e)$, as relative to the equilibrium with no commitment total surplus is strictly greater and the ruler gets all of the increase. The following proposition establishes these arguments formally.

Proposition 2 *When state support does not augment hidden production (i.e. $k = b$) and the ruler can commit to taking no more than a lump-sum tax $T(e) = \max\left[0, e - b\left(H^{NC} - g\left(H^{NC}, \alpha\right)\right)\right]$, then it is an equilibrium for the firm to play $H^* = 0$ and the ruler to play $e^* = e^{FB}$.*

Proof. Focus first on the firm. If $e = e^{FB}$, then $T\left(e^{FB}\right) = e^{FB} - b\left(H^{NC} - g\left(H^{NC}, \alpha\right)\right)$. Thus, the firm faces the following problem:

$$\max_{H} \max\left[0, (1 - H)e^{FB} - T\left(e^{FB}\right)\right] + b\left(H - g\left(H, \alpha\right)\right) \tag{2.6}$$

We will partition the firm's strategy space $H \in [0, 1]$ into two intervals, and look for the optimum over each interval. For $H > H'$, where H' solves:

$$(1 - H')e^{FB} - T\left(e^{FB}\right) = 0 \tag{2.7}$$

$$e^{FB} - H'e^{FB} - e^{FB} + b\left(H^{NC} - g\left(H^{NC}, \alpha\right)\right) = 0$$

$$H' = \frac{b}{e^{FB}}\left(H^{NC} - g\left(H^{NC}, \alpha\right)\right)$$

the optimum H solves:

$$\max_{H \in (H', 1]} 0 + b\left(H - g\left(H, \alpha\right)\right) \tag{2.8}$$

This is identical to the firm's maximization problem (2.3) in the no-commitment case, giving utility of $b\left(H^{NC} - g\left(H^{NC}, \alpha\right)\right)$. (Observe that $H' < H^{NC}$, since from (2.7) $H'e^{FB} = b\left(H^{NC} - g\left(H^{NC}, \alpha\right)\right)$: production in the taxable sector is more efficient with first-best support than it is in the untaxable sector.)

In contrast, for $H \leq H^{NC}$, the optimum H solves:

$$\max_{H \in [0, H']} (1 - H)e^{FB} - T\left(e^{FB}\right) + b\left(H - g\left(H, \alpha\right)\right) \tag{2.9}$$

$$\max_{H \in [0, H']} -He^{FB} + b\left(H^{NC} - g\left(H^{NC}, \alpha\right)\right) + b\left(H - g\left(H, \alpha\right)\right)$$

Since by assumption $e^{FB} > b$, the solution to this problem is $H = 0$, giving utility of $b\left(H^{NC} - g\left(H^{NC}, \alpha\right)\right)$. Thus, the firm is indifferent between $H = 0$ and $H = H^{NC}$.

Now examine the ruler's choice. The ruler solves:

$$\max_{e} \min[(1 - H)e, T(e)] - c(e) \tag{2.10}$$

which if the firm is playing $H = 0$ is:

$$\max_{e} \min\left[e, \max\left[0, e - b\left(H^{NC} - g\left(H^{NC}, \alpha\right)\right)\right]\right] - c(e) \tag{2.11}$$

$$\Leftrightarrow \max_{e} \max\left[0, e - b\left(H^{NC} - g\left(H^{NC}, \alpha\right)\right)\right] - c(e)$$

Since the ruler is residual claimant on any revenues over $e - b\left(H^{NC} - g\left(H^{NC}, \alpha\right)\right)$, she will choose $e = e^{FB}$ so long as her utility from doing so is greater than her utility from playing $e = 0$, i.e. so long as $e^{FB} - c\left(e^{FB}\right) - b\left(H^{NC} - g\left(H^{NC}, \alpha\right)\right) \geq 0$. Clearly that is the case, since total surplus in this equilibrium:

$$e^{FB} - c\left(e^{FB}\right)$$

is strictly greater than total surplus in the equilibrium with no commitment:

$$\left(1 - H^{NC}\right) e^{NC} - c\left(e^{NC}\right) + b\left(H^{NC} - g\left(H^{NC}, \alpha\right)\right)$$

■

Example 3 *If $g\left(H, \alpha\right) = \frac{\alpha}{2} H^2$, with $\alpha > 1$, and $c(e) = \frac{1}{2} e^2$, then $T(e) =$*

$\max\left[0, e - \frac{b}{2\alpha}\right]$ *and there will be an equilibrium with support $e^* = 1 = e^{FB}$.*

Proposition 2 should be considered a limit result: under the assumptions of nondistortionary taxes and no contribution of state support to informal economic activity, the first-best outcome can be achieved. As we will see, this result does not hold when these assumptions are relaxed.

2.2.3 Model With Commitment – Tax Evasion Case

As discussed above, it is perhaps more plausible to think that in certain institutional environments hidden revenues represent simple tax evasion rather than production in a completely different sector unaffected by state support. To consider the role of commitment under this alternative assumption, let $k = e$ so that total production in the hidden sector is eH and total costs of hiding are $e \cdot g\left(H, \alpha\right)$. (The results in this section will be muted but not eliminated if $k = \beta e$, for some exogenous $\beta \in (0,1)$.) Further, as in Section 2.2.2, assume that the state can commit to taking no more than a lump-sum tax conditional on e, $T(e)$. For the firm to want to operate without hiding revenues, it must be guaranteed at least its utility from optimal revenue

hiding, which in the present environment is $e\left(H^{NC} - g\left(H^{NC}, \alpha\right)\right)$. Thus, a commitment by the ruler to take no more than $T\left(e\right) = \max\left[0, e - e\left(H^{NC} - g\left(H^{NC}, \alpha\right)\right)\right] =$ $e\left[1 - \left(H^{NC} - g\left(H^{NC}, \alpha\right)\right)\right]$ can support $H = 0$, thus avoiding one of the inefficiencies identified in Section 2.2.1. Nonetheless, a commitment to $T\left(e\right)$ cannot provide the first-best outcome. To see why, observe that if the firm is playing $H = 0$, the ruler's maximization problem (2.10) reduces to:

$$\max_{e} e\left[1 - \left(H^{NC} - g\left(H^{NC}, \alpha\right)\right)\right] - c\left(e\right) \tag{2.12}$$

Thus, the optimal level of state support satisfies $c_e(e) = 1 - \left(H^{NC} - g\left(H^{NC}, \alpha\right)\right) < 1$. This failure of commitment to achieve the first-best is the result of the role of state support in the "informal" sector. In essence, the opportunity to hide can be thought of as an outside option for the firm. In this version of the model, the size of this option is influenced by the level of state support e. For a higher e, the firm must be compensated more to avoid revenue hiding, implying that the marginal return to state support is less than in the "de Soto" case. In particular, the level of state support e in this equilibrium will be increasing in the taxability of economic activity, since applying the envelope theorem to the firm's maximization problem in the no-commitment case (2.3) shows that the firm must be compensated less, the higher is α. Summarizing:

Proposition 3 *When state support augments hidden production (i.e. $k = e$) and the ruler can commit to taking no more than a lump-sum tax $T\left(e\right) =$*

$\max \left[0, e - e \left(H^{NC} - g \left(H^{NC}, \alpha\right)\right)\right]$, *then there exists an equilibrium with* $H^* = 0$ *and* e^* *s.t.* $c_e(e^*) = 1 - \left(H^{NC} - g \left(H^{NC}, \alpha\right)\right)$. *In this equilibrium, the level of state support is increasing in taxability* α.

Proof. Omitted. ∎

Example 4 *If* $g \left(H, \alpha\right) = \frac{\alpha}{2} H^2$, *with* $\alpha > 1$, *and* $c(e) = \frac{1}{2} e^2$, *then* $T(e) =$ $\max \left[0, e \left(1 - \frac{1}{2\alpha}\right)\right]$, *with an equilibrium involving no hiding and support* $e^* = 1 - \frac{1}{2\alpha}$.

2.2.4 Model With Commitment – Tax Evasion Case (Distortionary Tax)

Up to now we have been giving efficiency as much of a chance as possible by assuming that the ruler can commit to a nondistortionary tax. As we have seen, even with that assumption state support is increasing in taxability if support boosts hidden as well as unhidden revenues. Nonetheless, even Proposition 3 predicts no revenue hiding by the firm, a result that seems to be at odds with the reality of some degree of revenue hiding in all countries, including those where states have some ability to commit. In this section, we assume that for exogenous reasons the ruler may be unable to commit to a nondistortionary tax, but may commit to a proportional tax on unhidden revenues. Such taxes are widely observed in practice, of course, so the results of this section may be of empirical relevance.

In particular, assume that the ruler can commit to a proportional tax t on unhid-

den revenues. Further, assume as in the previous subsection that $k = e$, so that state support is useful in the "informal" sector. We will proceed in steps, first deriving the equilibrium for a given t, and then solving for the optimal t from the ruler's point of view.

Given a commitment to t, the firm solves:

$$\max_{H} (1 - t)(1 - H)e + e[H - g(H, \alpha)] \tag{2.13}$$

Clearly, it will be a dominant strategy for the firm to choose H such that $g_H(H, \alpha) = t$, which implies an inverse function $H = H(t, \alpha)$. Given the assumptions in (2.1) on the function $g(H, \alpha)$, $H(t, \alpha)$ has the following properties:

$$H_t > 0 \tag{2.14}$$

$$H_\alpha < 0$$

$$H_{t\alpha} < 0$$

Meanwhile, the ruler chooses e according to:

$$\max_{e} t(1 - H)e - c(e) \tag{2.15}$$

which together with the firm's dominant strategy $H(t, \alpha)$ implies that the optimal level of state support e^* is given by $c_e(e^*) = t(1 - H(t, \alpha))$.

Thus, in contrast to the previous two cases with commitment to a nondistortionary tax, commitment by the ruler to a proportional tax on unhidden revenues implies some level of revenue hiding, as when the ruler is unable to commit. Further, the level of

state support is decreasing in the level of revenue hiding. The following proposition recapitulates these results.

Proposition 4 *When state support augments hidden production (i.e. $k = e$) and the ruler can commit to a proportional tax on unhidden revenues t, the equilibrium level of hiding and support is given by the function $H = H(t, \alpha)$ (whose properties are summarized in (2.14)) and e^* s.t. $c_e(e^*) = t(1 - H(t, \alpha))$. Thus, there will be revenue hiding in equilibrium, with such hiding negatively associated with state support.*

Proof. Omitted. ∎

What Proposition 4 does not state is how the level of revenue hiding depends on the level of taxability if the ruler chooses t optimally. Examination of (2.14) shows that there are two results, one obvious and one ambiguous. As taxability α increases, the direct cost to the firm of hiding revenues increases, discouraging hiding. However, it seems plausible that if the ruler chooses t to maximize her revenues, then the tax rate may be higher, the more taxable is economic activity. If so, then higher taxability could indirectly encourage revenue hiding.

To further explore these considerations, we proceed with the following extended example (unambiguous analytical results do not seem possible without further assumptions on the shape of $g(H, \alpha)$), which demonstrates that under fairly general conditions these two effects may cancel each other out so that the level of revenue hiding is independent of taxability α.

Example 5 *Assume $g(H,\alpha) = \frac{\alpha}{x}H^x$, with $\alpha, x > 1$, and note that this function satisfies all assumptions in (2.1) and (2.2). (Assume as in the general model that $c = c(e)$, with $c_e, c_{ee} > 0$.) Then (dropping superscripts and arguments for the sake of presentation), $g_H = \alpha H^{x-1} = t$, implying optimal hiding $H = \left(\frac{t}{\alpha}\right)^{\frac{1}{x-1}}$ and support e s.t. $c_e(e) = t[1 - H]$. If the ruler chooses t to maximize her revenues, the optimal t solves:*

$$\max_t t[1 - H]e - c(e)$$

This is a concave problem, with the following first-order condition:

$$(1 - H - tH_t)e + (e_t + e_H H_t)t[1 - H] - (e_t + e_H H_t)c_e = 0 \qquad (2.17)$$

Recalling that $c_e = t[1 - H]$, (2.17) reduces to:

$$(1 - H - tH_t) = 0 \qquad (2.18)$$

Plugging in,

$$1 - \left(\frac{t}{\alpha}\right)^{\frac{1}{x-1}} - t\left[\left(\frac{1}{x-1}\right)(\alpha)^{-\frac{1}{x-1}}(t)^{\frac{1}{x-1}-1}\right] = 0 \qquad (2.19)$$

$$\Leftrightarrow t^* = \alpha\left(\frac{x-1}{x}\right)^{x-1} \qquad (2.20)$$

In other words, t^* is increasing in α, so taxability will have an indirect positive effect on hiding in addition to its direct negative effect. Solving for $H^*(t^*(\alpha), \alpha)$, we see:

$$H^*(t^*(\alpha), \alpha) = \left(\frac{t^*(\alpha)}{\alpha}\right)^{\frac{1}{x-1}} = \left(\frac{\alpha\left(\frac{x-1}{x}\right)^{x-1}}{\alpha}\right)^{\frac{1}{x-1}} = \frac{x-1}{x}$$

Thus, the level of revenue hiding is independent of the degree of taxability α. Further note that state support is increasing in α: $c_e(e^*) = t[1 - H^*(t^*(\alpha), \alpha)] = \frac{\alpha}{x}\left(\frac{x-1}{x}\right)^{x-1}$.

2.2.5 Summary

There is a recurring theme to the models presented above: rulers interested in tax revenues will generally provide greater support for economic activity when that activity is easier to tax. Most obviously, this will be the case because the state cannot commit to not taking all that a firm produces and leaves unhidden. Firms will hide to the extent they can get away with it, with those that find hiding more difficult doing it less and consequently receiving more support from the state.

However, even when the state can commit to not taking all that a firm produces, taxability may exert an influence on state support indirectly through the size of the surplus the state must commit to leaving behind to discourage revenue hiding. Only when state support has no influence on the size of the firm's "outside option" to hide revenues will taxability have no effect.

Beyond any theoretical interest, these models provide a framework in which to analyze the data discussed below. Firms in 23 postcommunist countries were queried on the degree of support received from state officials, as well as the extent to which firms like theirs hide revenues from tax authorities. We are interested in what the data say about both the nature of support and state commitment in these countries. Thus, before proceeding it may be useful to examine Table 2.1, which highlights the key empirical predictions of the models presented in this section.

2.3 Data

The empirical work in this and the following chapters is based on the Business

Environment and Enterprise Performance Survey (BEEPS) carried out in 1999 by the

World Bank and the European Bank for Reconstruction and Development. Through

the BEEPS project, firms were surveyed on various aspects of business-state relations,

including the topics covered in this dissertation. In all, 4104 small and medium-

sized enterprises were surveyed in 26 countries. The empirical work here uses a

subsample of the full BEEPS sample, restricting attention to firms located in the 23

postcommunist countries listed in Table 1.1. Firms in Bosnia-Herzegovina and the

Serb Republic in Bosnia were dropped due to the long war in those entities, while firms

in Turkey were not included since Turkey is not a postcommunist country.[7] In the

regression results reported below, we control for variation in institutional environment

across states by including country dummies.

Table 2.2 summarizes various characteristics of the firms in the sample. We are

primarily interested in the relationship of these characteristics to the taxability of the

firm's operations, though for various reasons each variable may have an independent

impact on the incentives of the state to support economic activity of that type. Large

enterprises are typically more taxable than small firms – small firms deal more in cash

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[7]Details on the survey and its implementation can be found in Hellman *et al* (2000) or at http://www.worldbank.org/wbi/governance/beeps/htm. Note that while Hellman *et al* (2000) refers to a survey of firms in twenty countries interviewed in 1999, six countries (Albania, Turkey, Latvia, Bosnia, the Serb Republic in Bosnia, and Macedonia) were added to the original project late in that year. The data set available on the World Bank website is the full data set, with all 26 countries represented.

(and thus find it easier to hide revenues), and tax inspectors avoid smaller firms to the extent that there are economies of scale in tax collection -- and so tend to be favored by the state (Gordon and Wilson 1999). Further, for both information and control reasons, the state may find it easier to extract revenues from state enterprises than from private firms (Roland and Verdier 1999), a fact emphasized in the literature on municipal support for locally owned township-village enterprises in China (e.g., Oi 1992, Che and Qian 1998). Foreign firms may be constrained for reasons of reputation or home-country legislation to more fully honor their tax obligations. Firms operating in a more competitive environment may feel greater pressure to cut costs by avoiding tax payments, while monopolies may find it harder to evade taxes if regulation of their activities provides the state with an advantage in control or information. Finally, technological considerations imply that some sectors will be especially easy to tax. For example, the ability of the state to control pipelines and other bottlenecks means that the natural-resource industry almost always provides a disproportionate share of state revenues, encouraging the state to pay particular attention to the needs of that sector (e.g., Shafer 1994).[8]

The enterprises in the BEEPS data set are not large, with a mean employment of 144, maximum employment of 1000, and employment of 500 or less for 97 percent of firms in the sample. Further, they are overwhelmingly private, although there is a non-trivial percentage of state-owned enterprises, and most are wholly domestically

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[8] Jones Luong and Weinthal (2002) discuss the difference in taxability of state and privately owned natural-resource firms.

owned. Firms in the sample generally face at least moderate competition, with 78 percent of respondents reporting that they have more than three competitors, and only 10 percent stating that they have none. A plurality of firms (30 percent) operate in the manufacturing sector, though other sectors are well represented.

Table 2.2 also reports the distribution of firms across city size. Since there is no coding for the exact location of the firm in the data set, and since it is possible that both taxability and state support are influenced by institutional environments finer-grained than mere country of residence, five dummy variables are included for the six town-size categories in all regressions to control for as much intra-country variation as possible.

Table 2.3 presents our measure of revenue reporting. Firms were asked, "What percentage of sales of a typical firm in your area of activity would you estimate is reported to the tax authorities, bearing in mind difficulties in complying with taxes and other regulations?"[9] Wording such as "typical firm in your area of activity" is standard in survey research when questions touch on sensitive matters, and it is typically assumed that respondents answer based on their personal experience. In our case, we can check this assumption by comparing the covariation of this variable

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[9]For this question, and the bribe and time-tax questions used as dependent variables in the OLS regressions, respondents were allowed to choose from a number of percentage ranges (e.g. "2-9.99 percent") rather than asked to name a number between 0 and 100. These questions were reconstructed as continuous variables due to the large number of possible responses, the inherently continuous (and linear) nature of the underlying variables, and the need to construct a variable that excluded bribe payments to tax and customs officials. Responses were coded as the midpoint of the range for the category chosen (e.g. "2-9.99 percent" is recorded as 6 percent), except for responses such as "more than 50 percent," which were coded as the low end of the range (i.e. 50 percent).

and various firm characteristics with publicly available data on tax compliance, as we do in the following section.

As can be seen, variation in responses is quite large, with a mean of 80 percent and standard deviation of 25 percent, and only 33 percent of firms saying that they report 100 percent of revenues to tax authorities. Thus, despite possible *a priori* concern that firms would be afraid to admit to any revenue hiding (by firms like theirs), the modal response indicates some degree of tax evasion.[10]

Table 2.3 also provides summary statistics and frequency distributions for the various measures of state support used in the following section. The first three variables are quantitative measures of the burden of the state on business, which we recode in the regressions below so that a higher response for the dependent variable consistently reflects more state support of economic activity. Thus, for example, "bribe payments as a percent of revenues" is recoded as the percent of revenues *not* paid as bribes.

Substantial variation is evident in all three quantitative measures. On average, entrepreneurs in all three postcommunist countries report paying 2.6 percent of their revenues (not profits!) as "unofficial payments to government officials," with the mean response in Eastern Europe and the Baltics (1.8 percent) substantially less than that

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[10] While this question only refers to revenues, it is likely that firms which find it easier to hide revenues can also more easily hide expenses if they choose to do so, especially if it is the proportion of transactions in cash that primarily determines firms' responses. In particular, firms that operate largely in cash may be able to pay a substantial percentage of employee compensation in cash. Thus, this question likely captures the degree to which firms are able to collude with employees to avoid social taxes and withholding of income taxes, as well as their ability to evade profit taxes, VAT, and other taxes related to revenues.

in the former Soviet Union less the Baltics (3.4 percent). A similar pattern is noted for the variable "non-tax bribe payments as a percent of revenues," in which bribe payments to tax and customs officials are subtracted out to control for the fact that firms may bribe tax officials to allow them to underreport revenues. (Recall that we are interested in the correlation between tax reporting and various measures of state support, including the degree of corruption.) Finally, an average of 9.9 percent of management time is spent dealing with government officials, with the mean percentage in Eastern Europe and the Baltics (7.2 percent) again substantially lower than that in the former Soviet Union less the Baltics (12.6 percent).[11]

Among our qualitative measures of state support, the first variable – "opportunity to appeal administrative violations" – captures in a fairly direct way the degree to which firms expect that higher-level state officials will protect them against arbitrary behavior by lower-level bureaucrats. The expectation that "contracts and property rights [will be] enforced" is obviously critically important for private investment to take place, and many scholars assume this to be one of the primary services the state can provide to the private sector. Finally, the variable "local government helpful" proxies for the general evaluation by entrepreneurs of the support provided by the state. All three qualitative measures exhibit considerable dispersion among the possible responses.

[11]Much other empirical work has noted the sharp divide in the business environment between the two halves of the postcommunist world. See, e.g., Frye and Shleifer (1997), Johnson et al (2000), and EBRD (1999). The last report uses data from the BEEPS project.

2.4 Results

In this section we empirically explore the empirical predictions of the models presented in Section 2.2. As Table 2.1 demonstrated, the models provide similar predictions with respect to the relationship between state support and taxability, but sharply different predictions about the nature and effect of revenue hiding.

A first rough test of the models presented above (albeit one with little power to distinguish among models, as discussed below) is to regress our various measures of state support on the firm characteristics summarized in Table 2.2, since as discussed in Section 2.3 each of these characteristics can be thought of as influencing taxability α for one theoretical reason or another. As Tables 2.4 and 2.5 show, state support is positively associated with two firm characteristics in particular that an outside observer might assume would imply greater taxability. Employment is significantly and positively correlated with our various measures of support in every case except for the "percent of management time not spent with government officials" variable. State ownership follows a similar pattern, with the estimated coefficients on all but the time variable positive (presumably, managers must spend time with the owners of a firm whoever they are, so that managers of state-owned enterprise will spend more time with state officials), and four of the five positive coefficients are precisely estimated. Estimated effects for these two variables are large. For example, an increase in employment from 1 to 1000 (an increase in log employment from 0 to 6.9) is estimated to reduce the percent of revenues paid as bribes by 2.2, while the probability that a

state-owned firm will respond that local government is mildly helpful is six percentage points higher than it is for a private firm (relative to an average probability of 17 percent).[12]

For the most part the estimated coefficients on the remaining firm characteristics are imprecisely estimated.. Monopolies are significantly more likely to say that they pay less in bribes and that local governments are helpful, while firms operating in the financial sector report significantly less bribe payment and better contract enforcement than do manufacturing firms. Overall, however, the primary impression given by Tables 2.4 and 2.5 is that large firms and state-owned enterprises are likely to receive more support.

That said, the results in Tables 2.4 and 2.5 must be treated with caution, as there may be other reasons why firms which are more taxable receive more state support. For example, collective-action theory suggests that large enterprises may find it easier to deal with state officials than do small firms. Further, while roughly consistent with all but the "de Soto" model in the previous section, the regressions in Tables 2.4 and 2.5 do little to identify why more taxable firms might receive more support. To identify the role of commitment problems and efficiency of taxation, we need to look at patterns of revenue hiding across firms.

The fact that two thirds of firms report some level of revenue hiding, as indicated

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[12]The marginal effects in Table 2.4 are calculated at the means of the independent variables, and are given as the discrete change for dummy variables. Further, due to limitations of space, effects are given for the second-right-most category of the dependent variable only (as Table 2.2 suggests, the probability of falling into the right-most category is small).

in Table 2.3, suggests that business-state relations in postcommunist countries may suffer either from the inability of the state to commit to an efficient tax schedule, or from inefficiencies in taxation. Tables 2.6 and 2.7 further explore this possibility by reporting the results of regressions of our various measures of state support on the proportion of revenues reported to tax authorities. (Note again that we use revenue reporting rather than revenue hiding for consistency with the following chapters.) In all these regressions, we control for the firm characteristics discussed above, since any of these variables might exert an independent effect on the propensity of state officials to support economic activity.

As can be seen, revenue reporting is a consistently positive, and very precisely estimated, predictor of state support. For all six variables the estimated coefficient on "proportion of revenues reported" is statistically significant at the 1 percent level, and marginal effects are large. Thus, for example, a firm which hides nothing pays one percent less of its revenues as non-tax bribes than does a firm which hides 50 percent of its revenues. (Recall that we subtract out bribes paid to tax and customs officials for the "non-tax bribes" variable, since firms may pay bribes to reduce their tax burden.) A similar increase in revenue reporting increases the probability that the firm says it always has the opportunity to appeal administrative violations by three percentage points (relative to an average probability of 10 percent) and that it mostly has that opportunity by two and one half percentage points (relative to an average probability of 16 percent).

One possible concern with the regressions reported in Tables 2.6 and 2.7 is that the BEEPS questionnaire contains no question that can be used to compare profitability of firms. Thus, one could question whether revenue reporting and state support of economic activity are both correlated with profitability, in which case the estimated coefficients on revenue reporting would be biased. In particular, it is conceivable that more profitable firms are both more likely to be asked for bribes (if bureaucrats are at least partially able to observe profitability) and more likely to hide their revenues from tax inspectors. However, if one looks at the estimated coefficients on the "monopoly" variable, it appears that more profitable firms (those with less competition) pay less in bribes, not more. Further, it is far from obvious why more profitable firms would receive less support along other dimensions. For example, in postcommunist countries there are often various means of contract enforcement available – bribing judges, hiring "debt-collection agencies," etc. – and more profitable firms may have better access to these alternative mechanisms. Finally, all regressions control for sector at a fairly fine level, so much variation in profitability is likely accounted for.

An additional consideration concerns choice of strategy to lower tax payments. One can think of firms as having two options available: they may hide their tax obligations, or they may report their liability but then refuse to pay. The latter strategy is likely to be employed by politically powerful firms, which may also find it easier to acquire state support. Thus, if the variable "political power" is not completely captured by observable characteristics, the positive correlation between

revenue reporting and state support could be spurious.

To check for this possibility, all regressions in Tables 2.6 and 2.7 were rerun controlling for whether or not the firm receives "subsidies (including tolerance of tax arrears) from local or national government." In all, 11 percent of firms report that they received such subsidies. While this variable is generally positively correlated with our various measures of state support, its inclusion has virtually no effect on the point estimates for the coefficient on "proportion of revenues reported."

Overall, the results reported on Tables 2.6 and 2.7 are consistent with both the no-commitment model and the model of commitment to a proportional tax, as both models predict state support to be decreasing in revenue hiding (increasing in revenue reporting). In the specific case of the proportional-tax model presented in Example 5, however, revenue hiding is unaffected by taxability α, implying that any variation in revenue hiding observed in practice (perhaps because we have not completely captured institutional variation with our country and town-size dummies) should be uncorrelated with the taxability of economic activity at the firm level. To some extent, then, we may be able to differentiate between commitment and distortionary-tax effects by checking whether revenue reporting is correlated with firm characteristics in a way that suggests a positive correlation with taxability α.

Table 2.8 presents the results of a regression of the percent of revenues reported to tax authorities on the same firm characteristics used in the previous regressions. As can be seen, firms reporting higher degrees of tax compliance are generally those that

we would expect to find it harder to hide revenues from tax authorities. Large enterprises hide substantially less of their revenues from tax authorities, as do firms with some level of foreign ownership. The percentage of revenues reported by monopolies is nearly 12 points higher than it is for firms with more than three competitors.

Further, the relationship between business sector and tax reporting follows an intuitive pattern: firms in sectors dealing primarily in cash report less to tax authorities than do manufacturing firms, while natural-resource and finance firms (whose operations may be relatively easy to track) report more. As can be seen in Table 2.9, these results are consistent with publicly available information on tax receipts by sector in Russia. The one significant discrepancy – the transportation sector in Russia is a disproportionately large contributor of tax receipts – may be explained in part by the exclusion from the BEEPS survey of pipeline and other large transportation firms.[13]

Only the relationship between state ownership and tax reporting does not follow the expected pattern. State-owned firms do not report significantly more of their revenues to tax authorities than do private firms, despite the advantages of control and information presumably conferred by ownership. Nonetheless, as we saw in Tables 2.4 through 2.7, state-owned firms do generally receive more support from state officials. One explanation for this pattern which is consistent with the models presented above is that state-owned firms are more "taxable" in the sense that the state has means of

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[13]MacFarquhar (1997) reports that pipeline operators in Russia contribute roughly twice as much to tax receipts as they do to GDP.

extracting revenues from such firms in a form other than taxes. Thus, for example, a large number of the contributors to a fund to finance the reconstruction of a palace in St. Petersburg for government use are enterprises in which the federal or regional governments have ownership stakes.[14] An alternative possibility is that managers of state-owned enterprises have access through their social networks to state officials that their private-sector counterparts do not.[15]

All the regressions reported in this section include country and town-size dummies to try to control for as much institutional variation as possible. Nonetheless, it is possible that there is unobserved institutional variation, as might be the case if firms were surveyed in cities with very different political-economic environments but which fell into the same town-size category. As an additional robustness check, all regressions in Tables 2.4 to 2.8 were rerun on the subsample of firms in capital cities, since we know that each country has only one capital. While doing so substantially shrinks the sample size, qualitative results for these regressions are virtually identical. Among our key results, the only substantial difference is that the estimated coefficient on "proportion of revenues reported" in the "local government helpful" regression drops to essentially zero. Elsewhere, estimated coefficients occasionally lose their significance, but are still sizeable in magnitude and of the same sign.

In sum, the empirical data are strongly suggestive of the no-commitment model, and somewhat less so of the model in which the state has commitment power but

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[14]See, e.g., "Kozhin prosit eshche $50 mln na dvorets," *Vedomosti*, August 5, 2002; "Renessans Konstantinovskogo dvortsa," *Rosbalt*, February 28, 2003.

[15]On "Social Networks and Corruption," see Gehlbach (2001).

cannot use non-distortionary lump-sum taxes. The models of Sections 2.2 and 2.3 in which the state could commit to a nondistortionary lump-sum tax can be rejected on multiple grounds: revenue hiding is observed in practice, is strongly associated with state support along a number of dimensions, and is negatively correlated with firm characteristics which suggest that the firm may find it difficult to hide revenues.

2.5 Conclusion

This chapter began by asking how commitment issues and information asymmetries interact in determining the relationship between the state and economic actors. In addressing this question theoretically, the models in Section 2.2 provide a pessimistic response: only under the most limiting assumptions will it be possible for state and society to achieve an efficient outcome in which production is not hidden from the state, and the state provides the efficient level of support of economic activity. Even when the state can commit to leaving economic actors with a portion of their production and can thus discourage revenue hiding, the level of state support may depend on the taxability of economic activity. In essence, when economic actors find it easier to hide their production, they must be compensated more to forego that option, which may reduce the desire of the state to provide a supportive economic environment.

Of all the models presented in this chapter, the "worst-case" scenario, involving no commitment power by the state, best fits the data analyzed in Section 2.4. Firms

surveyed in 23 postcommunist countries typically report some degree of tax evasion, with firms that hide less from the state generally receiving more support from state officials along a variety of dimensions. Further, firms which hide more have characteristics suggesting that they find it less costly to hide, a pattern which the models above suggest would not be evident if the state could commit to leaving firms with a portion of their production.

This suggests an obvious direction for future research: One might imagine a different distribution of outcomes in countries where for historical reasons the state is better able to commit and where the state has more experience in taxing private economic activity. Thus, it would be interesting to explore the extent to which the empirical findings here hold in other political-economic contexts. Further, it might be fruitful to track changes over time in postcommunist countries. It is certainly within the spirit of the transactions-cost literature to expect institutions to evolve to minimize the commitment problems identified in this chapter.

Table 2.1: Comparison of Model Predictions

Model	Support (with respect to α)	Support (with respect to H)	Hiding (with respect to α)
No Commitment	Increasing	Decreasing	Decreasing
Commitment – de Soto	Constant	N/A	Constant ($H = 0$)
Commitment – tax evasion	Increasing	N/A	Constant ($H = 0$)
Commitment – tax evasion (proportional tax)	Increasing?	Decreasing / N/A?	Constant ($H > 0$)?

Table 2.2: Firm Characteristics

Variable	Mean/proportion
Employment	144 (174)
State	0.13
Private	0.87
Foreign ownership	0.13
No foreign ownership	0.87
Number of competitors	
- None	0.10
- 1-3	0.13
- More than 3	0.78
Transportation sector	0.06
Personal-service sector	0.06
Construction sector	0.09
Wholesale sector	0.14
Business-service sector	0.06
Retail sector	0.14
Manufacturing sector	0.30
Resource sector	0.13
Other sector	0.02
Finance sector	0.02
Capital city	0.29
Other, over 1 million	0.06
Other, 250,000 – 1 million	0.13
Other, 50,000 – 250,000	0.19
Other, under 50,000	0.24
Rural	0.09

Note: Standard deviation of employment reported in parentheses.

Table 2.3: Revenue Reporting and State Support

Variable Name	Question on Survey	Responses					
A. Revenue Reporting		Mean	Standard deviation		< 100%	100%	
Percent of revenues reported	"What percentage of sales of a typical firm in your area of activity would you estimate is reported to the tax authorities, bearing in mind difficulties in complying with taxes and other regulations?"	80.0	24.8		2271 65.1%	1220 34.9%	
B. State-Support Variables in OLS Regressions		Mean	Standard deviation				
Bribe payments as percent of revenues	"On average, what percent of revenues do firms like yours typically pay per annum in unofficial payments to public officials?"	2.6	4.8				
Non-tax bribe payments as percent of revenues	Previous question, subtracting out that proportion of unofficial payments spent "to deal with taxes and tax collection" and "to deal with customs/imports."	1.7	3.3				
Percent of management time spent with government officials	"What percentage of senior management's time per year is spent dealing with government officials about the application and interpretation of laws and regulations?"	9.9	12.7				
C. State-Support Variables in Ordered-Probit Regressions							
		Never	Seldom	Sometimes	Frequently	Mostly	Always
Opportunity to appeal administrative violations	"If a government agent acts against the rules I can usually go to another official or to his superior and get the correct treatment without recourse to unofficial payments."	602 18.9%	700 22.0%	762 24.0%	266 8.4%	503 15.8%	345 10.9%
		Strongly disagree	Disagree in most cases	Tend to disagree	Tend to agree	Agree in most cases	Fully agree
Contracts and property rights enforced	"To what degree do you agree with this statement? 'I am confident the legal system will uphold my contract and property rights in business disputes.'"	366 9.8%	568 15.2%	929 24.9%	1057 28.3%	577 15.5%	237 6.4%
		Very unhelpful	Mildly unhelpful	Neutral	Mildly helpful	Very helpful	
Local government helpful	"How helpful do you find local/regional governments towards businesses like yours?"	1132 30.9%	646 17.7%	1040 28.4%	677 18.5%	165 4.5%	

Notes: In regressions reported in Table 7, the dependent variables in the OLS regressions are recoded so that a higher response consistently reflects more government support of business activity, e.g. "Percent of revenues *not* paid as bribes" is equal to 100 minus "Bribe payments as percent of revenues.

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Table 2.4: Effect of Firm Characteristics on State Support – OLS Regressions

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

	Percent of Revenues *Not* Paid as Bribes		Percent of Revenues *Not* Paid as Non-Tax Bribes		Percent of Management Time *Not* Spent with Government Officials	
	Estimated coefficient	Robust std. error	Estimated coefficient	Robust std. error	Estimated coefficient	Robust std. error
Log employment	0.43***	0.07	0.32***	0.05	-0.23	0.16
State-owned enterprise	0.46**	0.23	0.49***	0.15	-3.62***	0.78
Foreign ownership	-0.08	0.26	0.29*	0.16	-1.19*	0.66
Monopoly	0.96***	0.27	0.61***	0.18	-0.12	0.82
1-3 competitors	0.01	0.28	0.02	0.20	-0.67	0.68
Personal-service sector	0.08	0.37	-0.14	0.32	1.08	0.94
Transportation sector	0.34	0.31	0.21	0.24	-0.38	0.99
Wholesale sector	-0.42	0.31	0.18	0.23	0.36	0.69
Retail sector	-0.29	0.34	-0.03	0.27	-0.88	0.80
Construction sector	-0.64*	0.37	-0.49*	0.28	-1.82**	0.93
Business-service sector	-0.26	0.46	0.36	0.27	-0.66	0.98
Other sector	0.23	0.76	0.52	0.32	2.72*	1.55
Resource sector	0.04	0.32	0.00	0.22	0.27	0.78
Finance sector	0.89**	0.39	0.96***	0.21	-1.98	1.84
N	2832		2542		3326	
R^2	.110		.092		.099	

Notes: Wording of dependent variables reflects coding so that a higher response consistently reflects more government support of business activity; see Table 2.2 for details. Private, no foreign ownership, more than three competitors, and manufacturing firms omitted categories. Constant and country and town-size dummies included in all regressions.

Table 2.5: Effect of Firm Characteristics on State Support – Ordered-Probit Regressions

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

	Opportunity to Appeal Administrative Violations			Contracts and Property Rights Enforced			Local Government Helpful		
	Estimated coefficient	Robust std. error	Marginal effects (Pr = .16)	Estimated coefficient	Robust std. error	Marginal effects (Pr = .15)	Estimated coefficient	Robust std. error	Marginal effects (Pr = .17)
Log employment	0.06***	0.02	0.01	0.08***	0.01	0.01	0.12***	0.01	0.03
State-owned enterprise	0.08	0.07	0.01	0.32***	0.06	0.06	0.26***	0.06	0.06
Foreign ownership	0.07	0.06	0.01	-0.01	0.05	0.00	-0.03	0.05	-0.01
Monopoly	0.12	0.08	0.02	0.08	0.07	0.01	0.16**	0.07	0.04
1-3 competitors	-0.05	0.06	-0.01	-0.02	0.06	0.00	0.05	0.06	0.01
Personal-service sector	0.13	0.10	0.02	0.08	0.09	0.02	0.16*	0.09	0.03
Transportation sector	0.11	0.09	0.02	-0.03	0.08	-0.01	0.08	0.09	0.02
Wholesale sector	-0.04	0.06	-0.01	0.04	0.06	0.01	-0.07	0.06	-0.01
Retail sector	-0.07	0.07	-0.01	0.02	0.06	0.00	0.04	0.06	0.01
Construction sector	-0.08	0.07	-0.01	-0.03	0.07	-0.01	-0.02	0.07	0.00
Business-service sector	0.09	0.08	0.01	0.10	0.08	0.02	0.13	0.08	0.03
Other sector	0.13	0.20	0.02	0.31*	0.16	0.06	0.35**	0.16	0.08
Resource sector	-0.03	0.08	0.00	0.03	0.07	0.01	0.12	0.07	0.03
Finance sector	0.18	0.14	0.03	0.41***	0.12	0.08	0.02	0.11	0.00
N	3087			3634			3561		
Maximized log likelihood	-5257.1			-5750.2			-4986.7		

Notes: Less than 100% of revenues reported, private, no foreign ownership, more than three competitors, and manufacturing firms omitted categories. Constant and country and town-size dummies included in all regressions. Marginal effects are given for second-right-most category (see Table 2.2), are calculated at means of independent variables, and are given as discrete change for dummy variables.

Table 2.6: Effect of Revenue Reporting on State Support – OLS Regressions

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

	Percent of Revenues Not Paid as Bribes		Percent of Revenues Not Paid as Non-Tax Bribes		Percent of Management Time Not Spent with Government Officials	
	Estimated coefficient	Robust std. error	Estimated coefficient	Robust std. error	Estimated coefficient	Robust std. error
Proportion of revenues reported	2.75***	0.43	1.98***	0.32	3.30***	1.02
Log employment	0.38***	0.07	0.28***	0.05	-0.14	0.17
State-owned enterprise	0.47**	0.22	0.49***	0.15	-3.60***	0.81
Foreign ownership	-0.17	0.26	0.21	0.17	-1.42**	0.69
Monopoly	0.74***	0.28	0.44**	0.19	-0.63	0.88
1-3 competitors	-0.09	0.29	-0.07	0.20	-0.83	0.71
Personal-service sector	0.18	0.39	-0.03	0.33	1.46	0.98
Transportation sector	0.35	0.32	0.26	0.25	0.11	1.06
Wholesale sector	-0.29	0.32	0.33	0.23	0.88	0.71
Retail sector	-0.37	0.35	-0.07	0.28	-0.50	0.82
Construction sector	-0.67*	0.38	-0.46	0.29	-1.85*	0.96
Business-service sector	-0.28	0.48	0.42	0.28	-0.73	1.03
Other sector	0.94**	0.42	0.68**	0.29	2.26	1.75
Resource sector	0.02	0.33	0.03	0.23	-0.07	0.81
Finance sector	0.63	0.40	0.82***	0.22	-2.75	1.97
N	2681		2412		3109	
R^2	.129		.110		.102	

Notes: Wording of dependent variables reflects coding so that a higher response consistently reflects more government support of business activity; see Table 2.2 for details. Private, no foreign ownership, more than three competitors, and manufacturing firms omitted categories. Constant and country and town-size dummies included in all regressions.

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Table 2.7: Effect of Revenue Reporting on State Support – Ordered-Probit Regressions

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

	Opportunity to Appeal Administrative Violations		Contracts and Property Rights Enforced		Local Government Helpful	
	Estimated coefficient	Robust std. error	Estimated coefficient	Robust std. error	Estimated coefficient	Robust std. error
Proportion of revenues reported	0.36***	0.09	0.25***	0.08	0.26***	0.08
Log employment	0.05***	0.02	0.07***	0.01	0.12***	0.01
State-owned enterprise	0.06	0.07	0.32***	0.06	0.26***	0.07
Foreign ownership	0.07	0.06	-0.03	0.06	-0.06	0.06
Monopoly	0.08	0.09	0.05	0.07	0.12	0.08
1-3 competitors	-0.06	0.06	-0.01	0.06	0.07	0.06
Personal-service sector	0.18*	0.11	0.13	0.09	0.15*	0.09
Transportation sector	0.09	0.09	-0.05	0.08	0.11	0.09
Wholesale sector	-0.01	0.06	0.07	0.06	-0.04	0.06
Retail sector	-0.06	0.07	0.04	0.06	0.05	0.07
Construction sector	-0.12	0.07	-0.04	0.07	-0.03	0.08
Business-service sector	0.10	0.09	0.11	0.09	0.15*	0.08
Other sector	0.18	0.20	0.31*	0.16	0.40**	0.17
Resource sector	-0.03	0.08	0.03	0.07	0.14*	0.08
Finance sector	0.13	0.14	0.41***	0.13	-0.01	0.12
N	2899		3396		3324	
Maximized log likelihood	-4926.2		-5363.2		-4651.3	
Marginal effects	Always (Pr = 0.10)	Mostly (Pr = 0.16)	Fully Agree (Pr = 0.04)	Agree in Most Cases (Pr = 0.15)	Very Helpful (Pr = 0.03)	Mildly Helpful (Pr = 0.18)
- Prop. of revenues reported	0.06	0.05	0.02	0.04	0.02	0.06

Notes: Private, no foreign ownership, more than three competitors, and manufacturing firms omitted categories. Constant and country and town-size dummies included in all regressions. Marginal effects calculated at means of independent variables.

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Table 2.8: Determinants of Revenue Reporting - OLS Regression
(Significance levels: 10% - *; 5% - **; 1% - ***)

	Percent of Revenues Reported	
	Estimated coefficient	**Robust std. error**
Log employment	2.35***	0.32
State-owned enterprise	0.66	1.31
Foreign ownership	4.88***	1.15
Monopoly	9.12***	1.42
1-3 competitors	2.63**	1.15
Personal-service sector	-3.72*	2.04
Transportation sector	-3.28	2.00
Wholesale sector	-1.90	1.44
Retail sector	-0.63	1.42
Construction sector	0.41	1.56
Business-service sector	0.49	1.96
Other sector	1.17	3.26
Resource sector	1.26	1.52
Finance sector	7.70***	2.31
N	3410	
R^2	.133	

Notes: Private, no foreign ownership, more than three competitors, and manufacturing firms omitted categories. Constant and country and town-size dummies included.

Table 2.9: Tax Receipts by Sector in Russia, 1997

	Percent of GDP (1)	Percent of Tax Receipts (2)	Column (2) / Column (1)
Agriculture	7.2	1.0	0.1
Services	16.1	8.6	0.5
Construction	8.7	6.5	0.7
Other	28.9	26.8	0.9
Transport	10.8	15.1	1.4
Industry	28.1	39.7	1.4
Banking	0.3	2.4	8.0

Source: M.P. Afanas'ev and P.V. Kuznetsov, *Nalogi v Rossii i v mire [Taxes in Russia and the World]*, 1997, Rabochii Tsentr Ekonomicheskikh Reform pri Pravitel'stvo Rossii [Working Center for Economic Reforms – Russian Government], p. 24

Chapter 3

Low-Productivity Traps

3.1 Introduction

An enduring puzzle of political economy is why economies persist in inefficient form when the possibility of evolution exists. Examples abound: Ten years into the post-communist transition, most individuals in the former Soviet Union remain employed by minimally profitable former state enterprises, while corruption and overregulation prevent new firms from taking root. Workers and politicians maintain their support for aging factories in monoindustrial towns, despite more profitable opportunities that only need a helping hand from the state to get off the ground. Governments in countries rich in natural resources preserve their symbiotic relationships with large extraction industries, despite clear evidence of the benefits of economic diversification.

As these examples suggest, what often needs explaining is the failure of the state

to provide the necessary support for new economic activity, rather than the failure of the economy to provide the necessary preconditions. Of course, what constitutes "support" will vary according to the political-economic context. In some cases, explicit state intervention may be necessary to break out of a low-productivity trap, perhaps by providing public goods necessary for economic development (including the necessary regulatory infrastructure, as stressed by Vogel 1996) or by solving the coordination problems of individual economic actors (as in the "big push" literature in development economics – see Rosenstein-Rodan 1943 and Murphy *et al* 1989). In others, what is needed is less of traditional state behavior: less corruption, less over-regulation, etc. Paradoxically, this hands-off approach may require the active (and costly) involvement of senior state officials if it is subordinate parts of the state that are doing the rent seeking. Alternatively, "support" may merely be restraint on the part of senior politicians, where the costliness of that support is the opportunity cost of rents foregone.

Whatever the nature of support, it is often underprovided by states, meaning that states do not equate the marginal social benefit of support with the marginal cost of providing it. Why that should be the case is the partial focus of a vast literature in political science and economics on ("bad") policy choice. Robinson (1998) surveys this literature, distinguishing between theories in which states are interested in maximizing social welfare but have incorrect beliefs about how to do so, and theories in which political actors choose inefficient policies because they have

interests other than welfare maximization in mind (see also Acemoglu 2002).

This chapter falls into the latter category, assuming as in much of the political-economy literature that the state is interested in tax revenues rather than social welfare (e.g., North 1981, Levi 1988, Brennan and Buchanan 1980), and that it thus allocates support across sectors based on the exogenous *taxability* of economic activity, i.e. the ease with which the state can extract revenues from economic actors. Building upon this basic argument, which was developed in detail in Chapter 2, the simple model presented in Section 3.2 below shows that factor mobility can exaggerate the impact of differences in taxability across sectors, so that even small differences in relative taxability can translate into large differences in support. States, interested in tax revenues, choose whether or not to support an economic sector based on its revenue potential, which is determined both by the size of sector and its taxability. But factors of production, if mobile, in turn choose whether or not to locate in a sector based in part on the degree of state support provided. Thus, the model suggests that state support and factors of production will pool together in one sector or the other, but not both simultaneously.

Two empirical predictions follow: First, one should see countries sorting themselves into two groups: one where state support and factors of production are concentrated in old, less productive economic activity, and one where they are concentrated in new, more productive economic activity. Second, movement from the "old equilibrium" to the "new equilibrium" – perhaps in response to an exogenous shock to

resource allocation – will be less likely if the old sector is relatively more taxable and if state support (however defined) is essential for economic output. Thus, countries can become stuck in low-productivity traps due to the relatively low taxability of alternative economic activity.

Section 3.3 applies the model to the "great divide" in postcommunist countries, where in Eastern Europe state support and resource allocation are concentrated in new businesses, while in the former Soviet Union both are concentrated in the old (formerly or still) state-owned sector. Consistent with the argument in this paper, it is indeed the case that there are small differences in taxability across firm types in Eastern Europe, but large differences in the former Soviet Union. While be no means the sole explanation for divergent performance in the postcommunist world – complementary explanations include the nature of political institutions (Hellman 1998), speed of reform (Aslund, Boone, and Johnson 1996), culture and historical experience (McDaniel 1996), the results of early elections (Fish 1998), and the incentives provided by the possibility of EU accession (Janos 2002) – the feedback mechanism identified in this paper may have contributed to the development of a sharp divide between two groups of countries rather than a smooth gradient of progress across countries.

In exploring the impact of taxability of economic activity on state support of economic activity, this chapter touches on many of the themes of the literature on fiscal incentives of politicians (see, e.g., Gordon and Li 1997), including work emphasizing

the influence of fiscal federalist systems in creating positive (as in China) or negative (as in Russia) incentives for local politicians to support growth.[1] However, most of this literature only considers the impact of government behavior on economic performance, and not the feedback from the latter to the former; as such, it does not explain the multiple equilibria predicted by this model and observed in reality. One exception is Berkowitz and Li (2000), but in their model the sector that is harder to tax (the unofficial sector) is less productive than the sector easier to tax. As will be argued below, quite often the opposite is true.

Models in which resource allocation to a particular sector in turn encourages more allocation to that sector include the formalization of the "big push" argument cited above, as well as models of the unofficial economy in transition countries (Johnson *et al* 1997, Roland and Verdier 1999). As in the unofficial-economy models, state support in the model here flows into a particular sector only if resources are concentrated in that sector, while resource concentration is in turn determined by state support. Unlike in the unofficial-economy models, the state is a monopoly provider of public goods (support) in this paper, and is a strategic actor. The distinctions are important: when the state has a monopoly over public goods provision, higher taxability unambiguously discourages resource allocation to a sector unless state officials are strategically motivated to provide support in part based on a sector's contribution to tax revenues. When they are so motivated, the additional support engendered by

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[1] On fiscal federalism, see, e.g., Oi (1992) and Qian and Weingast (1996) on China, and Zhuravskaya (2000) on Russia.

higher taxability can encourage factors to locate in a sector, perhaps in dispropor-
tionate measure to differences in taxability across sectors.

While useful, the simple model presented in Section 3.2 abstracts from reality in
various ways. Through a series of extensions to the basic model, Section 3.4 examines
the robustness of the argument, considering the provision of public goods financed by
tax revenues, the necessity of state support for economic activity, and economies of
scale in the provision of that support. Discussion of welfare considerations concludes
the section and the chapter.

3.2 A Simple Model

Consider an economy in which there are two economic sectors, indexed by $S \in$
$\{O, N\}$, where O represents an old sector and N a new sector. For simplicity,
assume labor to be the sole input into production, with total labor supply inelastic
and normalized to one, and the proportion of labor in sector i equal to L_i.[2] (In what
follows, we will often refer to "resources" rather than labor.) Labor is homogenous,
and production from labor is augmented by a sector-specific productivity parameter
α_S and sector-specific state support e_S, so that total output in sector S is $Y_S =$
$\alpha_S L_S e_S$. For a given level of state support, productivity in the new sector will

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[2]Elasticity of total labor supply can be easily incorporated into the model by assuming that there
is an alternative sector R which is nonproductive (or at least nontaxable) and which provides utility
to labor of $u(L_R)$, with u concave and certain limit conditions assumed. Of the major results in this
section, multiple equilibria will hold (with the same indifference conditions defining the intermediate
equilibrium) regardless of the elasticity of total labor supply, while Corollary 1 will hold if total
labor supply is not too elastic, i.e. if marginal returns to labor in sector R diminish quickly enough.

typically be higher, so that $\alpha_N > \alpha_O$. Thus, in contrast to the old sector, the new sector might be unburdened by an obsolete capital stock or a difficult-to-replace workforce, or might benefit from a different ownership form. Nonetheless, overall productivity might be lower in the new sector if state support is insufficient.

In this section we assume that state support is necessary for production to take place, and that this support is sector-specific. We relax the assumption of necessity in Section 3.4.2. Let e_N and e_O be the level of support of the new and old sector, respectively. This assistance might take two forms. First, the state may have a role to play in facilitating economic activity by providing the necessary legal framework for markets to exist and by solving certain coordination problems. In the U.S., for example, internet commerce has been encouraged by legislation recognizing electronic signatures as legally binding, while in postcommunist Europe legislation and decrees legalizing markets were necessary before private economic activity could operate on any substantial scale. Second, in many political-economic environments, corruption, overregulation, and other "government failures" are the norm, with relief possible only through the active intervention of senior state officials.

Regardless of whether the state offers a "helping hand" or restrains its "grabbing hand" (Shleifer and Vishny (1998)), providing support is costly: promoting one package of laws means that other bills are pushed off the legislative calendar or political capital is expended, giving up a share of bribes collected by lower-level bureaucrats implies an opportunity cost, preventing maladministration by lower-level state offi-

cials requires time and energy, etc. For simplicity, in this section we assume that this cost is not borne by the treasury, but rather is a personal cost $c(e_O + e_N)$ of the senior officials which make up the state, with $c(.)$ strictly increasing and convex, $c(0) = 0$, and $\lim_{x \to 0} c'(x) = 0$.[3] In Section 3.4.1 we show that qualitatively similar results obtain if we instead assume that public goods are financed out of tax revenues.

Since supporting economic activity is costly, the state will weigh the cost of support against the benefits. In this model, we assume that the benefits come in the form of increased tax revenues. That states are interested in at least some tax revenue should be uncontroversial: even proponents of the most limited state would support taxation to pay the night watchman. Nonetheless, this assumption may be less reflective of reality the better are states at collecting taxes. Thus, this is a model of a political economy in which tax revenue is relatively scarce, i.e. where the desire for tax revenue dominates considerations other than the cost of supporting economic activity. In Section 3.3, we use the model to interpret the experience of postcommunist countries, many of which have faced particularly acute fiscal crises following the collapse of communism.

We assume that the proportion of revenues that can be extracted from a particular sector is exogenous, with T_S being the level of taxability of sector S. There are two possible interpretations of this assumption. First, the state can be viewed as setting tax rates optimally, given the opportunities for tax evasion in a particular sector.

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[3]This functional form is chosen for simplicity. We could instead assume cost $c(e_O, e_N)$, with $c_S, c_{SS} > 0$, $c_{OO} c_{NN} > (c_O c_N)^2$, $c(0,0) = 0$, and $\lim_{e_S \to 0} c_S(e_O, e_N) = 0$, with analogous results.

Thus, the level of taxability of a given sector represents the tax rate associated with the peak of the Laffer curve for that sector.[4] Second, the state in this model can be viewed as a lower-level (regional, local) authority whose taxing power is set by a higher-level government, as in a fiscal federalist arrangement. Of course, the central government may also take the relative taxability of different sectors into account when setting tax rates. In either case, T_N will often be less than T_O. For example, as will be discussed in Section 3.3 below, governments in the former Soviet Union have found it especially difficult to extract tax revenues from new, small firms relative to old, large enterprises. Similarly, governments in resource-rich countries often find it substantially easier to tax the resource-extraction sector than manufacturing or service activity.

Thus, the state solves the following problem:

$$\max_{e_O, e_N} T_O \alpha_O L_O e_O + T_N \alpha_N L_N e_N - c(e_O + e_N) \tag{3.1}$$

As marginal returns to state support are constant in each sector, the state will allocate all of its support to the sector offering the highest return, so that:

$$e_O = f(T_O \alpha_O L_O), \; e_N = 0 \text{ if } T_O \alpha_O L_O > T_N \alpha_N L_N \tag{3.2}$$

$$e_O = 0, \; e_N = f(T_N \alpha_N L_N) \text{ if } T_O \alpha_O L_O < T_N \alpha_N L_N$$

$$e_O + e_N = f(T_O \alpha_O L_O) = f(T_N \alpha_N L_N) \text{ if } T_O \alpha_O L_O = T_N \alpha_N L_N$$

[4]Crudely, consider a generalized version of this model in which the state sets tax rates t_O and t_N, with the cost of collecting taxes from a sector equal to zero for $t_s \leq T_s$, and infinitely (or sufficiently) high for $t_s > T_s$. Taking labor allocation as given, the politician will then set tax rates equal to T_O and T_N.

where we define $f(x)$ such that if $c'(y) = x$, $y = f(x)$. Obviously, given that $c(.)$ is a convex function, $f'(.) > 0$, while $f(0) = 0$ follows from the limit condition on $c'(.)$. Critically for the discussion that follows in Section 3.3, note that if T_N/T_O is low enough, the state will not support the new sector unless the bulk of labor is in that sector or the inherent productivity advantage of the new sector is overwhelming.

Simultaneously with the state decision, individuals decide how to allocate their labor between the new and old sector. Since labor is the only input into production, all post-tax profits accrue to the workers in that sector. Since agents are homogeneous, labor flows entirely to the sector offering the highest post-tax return. Thus,

$$L_O = 1 \ (L_N = 0) \text{ if } (1 - T_O)\alpha_O e_O > (1 - T_N)\alpha_N e_N \tag{3.3}$$

$$L_O = 0 \ (L_N = 1) \text{ if } (1 - T_O)\alpha_O e_O < (1 - T_N)\alpha_N e_N$$

$$L_O \in [0,1] \ (L_N = 1 - L_O) \text{ if } (1 - T_O)\alpha_O e_O = (1 - T_N)\alpha_N e_N$$

Comparing (3.2) to (3.3) shows the nature of equilibrium in this model: State support of an economic sector causes resources (here, labor) to be allocated to that sector, which in turn encourages the state to support the sector. Thus, there are multiple equilibria, as summarized in the following proposition:

Proposition 5 *When the state can provide support on a sector-specific basis, there are three equilibria:*

1) Old equilibrium: $L_O^* = 1$, $L_N^* = 0$, $e_O^* = f(T_O L_O)$, $e_N^* = 0$.

2) New equilibrium: $L_O^* = 0$, $L_N^* = 1$, $e_O^* = 0$, $e_N^* = f(T_N L_N)$.

3)   Intermediate equilibrium: $\frac{L_N^*}{L_O^*} = \frac{T_O \alpha_O}{T_N \alpha_N}$, $\frac{e_N^*}{e_O^*} = \frac{(1-T_O)\alpha_O}{(1-T_N)\alpha_N}$, $e_O^* + e_N^* = f(T_O \alpha_O L_O^*) = f(T_N \alpha_N L_N^*)$, *and* $L_O^* + L_N^* = 1$.

Proof. That (1) and (2) are equilibria is immediately apparent. The nature of the intermediate equilibrium follows from the condition for the state to be indifferent between providing support to the old sector and to the new $(T_O \alpha_O L_O = T_N \alpha_N L_N)$ and the condition for labor to be indifferent between locating in the old sector and the new $((1 - T_O)\alpha_O e_O = (1 - T_N)\alpha_N e_N)$. That no other equilibria are possible is discussed below. ∎

In one extreme equilibrium, the state supports the old sector but not the new, thus encouraging labor to locate in the old sector, which in turn reinforces the state decision to support that sector. A similar equilibrium exists where both state support and labor are concentrated in the new sector.

In each of the extreme equilibria, state support is $e_S^* = f(T_S \alpha_S)$, $e_{-S}^* = 0$, where S is the sector supported. Thus, state support in equilibrium is increasing in both the productivity of the supported sector and its taxability. From labor's point of view, then, an increase in taxability is not unambiguously bad, but must be weighed against the improved incentives it provides to the state. Indeed, as the following corollary indicates, given one further assumption on the shape of the cost function $c(.)$, labor utility will be increasing in taxability for sufficiently low T_S:

Corollary 1 *If $c''' \geq 0$, then labor utility in either of the extreme equilibria will be increasing in T_S for T_S sufficiently low, where S is the sector supported.*

Proof. Labor utility $U_{LS} = (1 - T_S)\alpha_S f(\alpha_S T_S)$ in the extreme equilibrium in support of sector S. Since $f'' \leq 0$, which follows from the shape of the cost function $c(.)$, U_{LS} is concave in T_S on $T_S \in (0, 1)$, with $\lim_{T_S \to 0} \frac{\partial U_{LS}}{\partial T_S} > 0$, and $\lim_{T_S \to 1} \frac{\partial U_{LS}}{\partial T_S} < 0$. Thus, $\frac{\partial U_{LS}}{\partial T_S} > 0$ over some interval $T_S \in (0, \bar{T}_S)$. ∎

Corollary 1 does not say that economic actors will not find it optimal to avoid paying taxes. For example, avoiding taxes is a dominant strategy, given that the state observes the tax behavior only of sectors and not of any individual taxpayer. However, Corollary 1 suggests that if tax evasion is easy, and state support of economic activity depends on the taxability of that activity, then efforts to improve revenue collection (by a central government interested in the impact of tax incentives at the local level, by taxpayers acting collectively) may not be unambiguously negative from the point of view of taxpayers.

There is also an intermediate equilibrium where the old and new sectors coexist, defined as in Proposition 5. In contrast to the extreme equilibria, this equilibrium is unstable. For example, if $L_O = \frac{\alpha_N T_N}{\alpha_O T_O + \alpha_N T_N} + \epsilon$, then the state will find it optimal to support the old sector only, which in turn will encourage that portion of the labor force still in the new sector to abandon it. Thus, the model predicts that one should observe political economies sorting themselves into two groups: one where political institutions support a new economic sector, which is where resources tend to be concentrated, and one where resources and state support remain concentrated in an old sector. Indeed, many observers have seen precisely this pattern develop

in postcommunist Europe, as by the late 1990s the countries of east-central Europe and the Baltics were more "new" in political-economic configuration, while the non-Baltic post-Soviet republics looked more "old." The following section discusses this development in terms of the basic model.

3.3 The "Great Divide" in Postcommunist Europe

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

political pressure on the state long after the enactors of privatization had disappeared from the political scene (see especially Boycko *et al*, 1995; also Schmidt 2000, Roland and Verdier 1994).

In essence, what many officials and analysts seemed to have in mind was a variant of the model presented in Section 3.2, where the future state would respond to political pressure from the owners of capital and their employees:

$$\max_{e_O, e_N} L_O e_O + L_N e_N - c(e_O + e_N) \tag{3.4}$$

In this formulation, it is the size of the sector, in the sense of allocation of resources, that is the first-order concern. The more resources allocated to a sector, the larger the incentive of the state to support it. As in the model in the previous section, when the state has such an objective function there is both an "old equilibrium" and a "new equilibrium." The hope was that privatization, carried out by political actors with objectives different from those defined in (3.4), would force the hand of future generations of policy makers. With capital and (especially) labor relatively immobile in the short run, state behavior would shift towards support of new, private economic activity if mass privatization pushed $\frac{L_N}{L_O}$ high enough, effecting a move towards a new equilibrium.

How successful were the architects of privatization in achieving this goal? To answer this question, we must be more precise about what "new" is. If one takes "new" to be private as opposed to state-owned economic activity, then privatization must be judged a success. Across the postcommunist world, property which has been priva-

tized has largely stayed in private hands. While a societal consensus has not formed everywhere in support of private property, there has been no major attempt to political elites to renationalize formerly state-owned property, and no major reallocation of resources out of the private sector back into that portion of the state sector which remains.[5] The "mass" nature of privatization in most postcommunist countries, in which $\frac{L_N}{L_O}$ reached very high levels, likely has much to do with the unwillingness of postcommunist politicians to seriously attempt renationalization.

However, with the benefit of hindsight, it now seems clear that the better definition of "new" is truly new economic activity. Across the postcommunist world, the performance of *de novo* enterprises has clearly outstripped that of privatized enterprises, even where privatization has had a beneficial economic impact (see, e.g., World Bank 2002, ch. 4, and the review in Havrylyshyn and McGettigan 2000). Despite the seeming efficiency benefits of promoting such economic activity, however, not all states have shown the same interest in providing an environment in which new firms can flourish, one where corruption and overregulation are kept to a minimum and contracts and property rights are enforced. In particular, a "great divide" (Berglof and Bolton 2002) has opened between Eastern Europe and the Baltics on the one hand, and the former Soviet Union less the Baltics on the other. In the former,

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[5]There are exceptions. In Russia, for example, there has been some attempt by governors to acquire ownership of enterprises which have accumulated large debts to regional governments. See, e.g., Barnes (2002) or *EWI Russian Regional Report*, Nov. 14, 2001, "New Ulyanovsk Governor Plans to Maintain Control Over Privatized Enterprises." Nonetheless, for the moment these appear to be the exceptions which prove the rule. On changes in attitudes as a result of privatization, see Earle and Gehlbach (2003).

states are generally supportive of new business activity, with a corresponding flow

of labor and capital into *de novo* enterprises. In the latter, both state support and

factors of production have largely remained in the old (state and privatized) sector.[6]

Figure 3.1 illustrates the divide: by the late 1990s, the share of employment in small

enterprises (a term largely synonymous with "new enterprises" in the postcommunist

world) was around 50 percent in Eastern Europe and the Baltics, while in the former

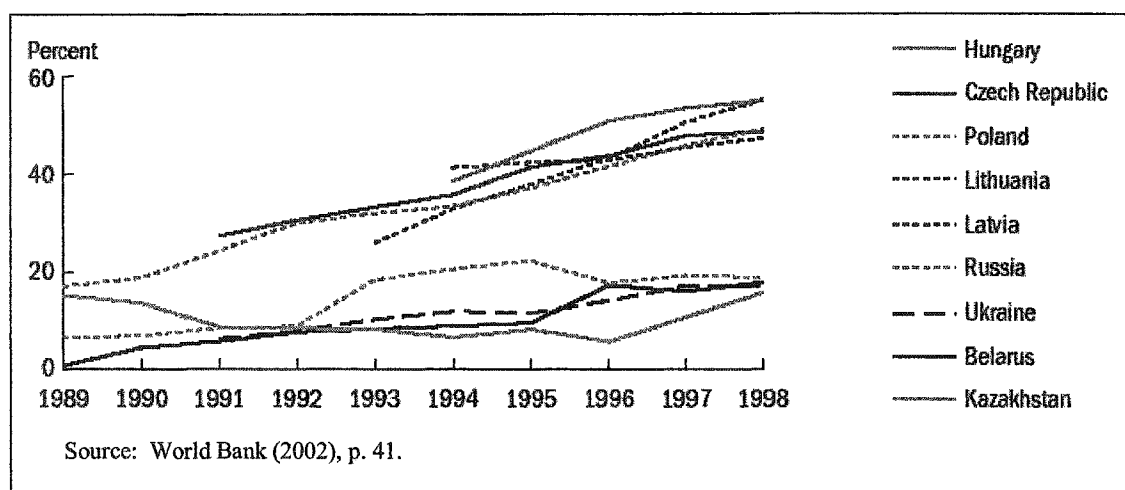Soviet Union less the Baltics small firms made up only one fifth of total employment.[7]

Figure 3.1: Share of Employment in Small Enterprises, 1989-98

What accounts for this sharp divide? As stressed in the introduction, there are

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[6]Various studies have explored government-business relations in transition countries using data from surveys of firms. See, e.g., Hellman, Jones, and Kaufmann (2000) for survey evidence from 22 postcommunist countries, Johnson *et al* (2000) for results from five East European and former Soviet states, Frye and Shleifer (1997) for a comparative analysis of Russia and Poland, Frye and Zhuravskaya (2000), Hendley, Murrell, and Ryterman (2001), and CEFIR and World Bank (2002) for Russia, and Pop-Eleches (1998) for Romania. The first three works all document the greater burden imposed on small businesses in the former Soviet Union.

[7]See also Boeri and Terrell (2002) on labor reallocation. World Bank (2002) discusses the equivalence of "small" and "new" in the postcommunist world.

many answers to this question; the point of this chapter is to add to, rather than subtract from, that inventory. In particular, the model presented in Section 3.2 suggests that states will provide support to new firms, which in the present context amounts to providing a bureaucratic environment which does not stifle new business activity, only if the benefit in the form of tax revenues is sufficient. As before, privatization might in principle have provided the exogenous shock to labor allocation necessary for the political economy to settle into the new equilibrium. After all, it was not only large manufacturing enterprises which were privatized, but also real estate, shops, and other assets which could be used to start new firms.[8] Nonetheless, this was clearly a smaller proportion of total assets in the economy than the share of private property overall post-privatization, so $\frac{L_N}{L_O}$ was not overwhelming. Given that, the question of whether the economy would tip into the new equilibrium or not depended more critically on the incentives facing governments in the region.

Those incentives were intimately related to the fiscal crisis that engulfed much of the postcommunist world following the collapse of communism (see, e.g., IMF 1998). The nature of the crisis was twofold: on the one hand, postcommunist politicians inherited levels of expenditure that could be reduced only at significant political cost; on the other, the tax revenues necessary to meet those obligations declined dramatically as a result of both the general output collapse and a decrease in the ability of the state to extract revenues from the economy. Faced with crumbling infrastructure,

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[8]On "small privatization" in postcommunist countries, see, e.g., Earle *et al* (1994).

wage arrears, and demands from various interest groups for subsidies and transfers, the desire to increase tax revenues has been a first-order concern for most postcommunist politicians.[9] In such an environment, the state objective function (3.1) in Section 3.2 is likely a better approximation of reality than (3.4).

The best-reply correspondence (3.2) shows that the state will find it optimal to support new firms only if $\frac{L_N}{L_O} \geq \frac{T_O \alpha_O}{T_N \alpha_N}$. Thus, in looking to explain the divergent performance of the two halves of the postcommunist world, we should look for evidence that $\frac{L_N}{L_O}$, $\frac{T_O}{T_N}$, or $\frac{\alpha_O}{\alpha_N}$ are markedly different in the former Soviet Union than in Eastern Europe. Substantial differences in $\frac{\alpha_O}{\alpha_N}$ can probably be dismissed on theoretical grounds: given the massive misallocation of resources in communist economies, the inherent productivity of any new enterprise was likely quite large relative to that of most of the old state sector across the postcommunist world. Table 1.1 above suggests that differences in $\frac{L_N}{L_O}$ were also small. There is little variation across postcommunist countries in the scale of small-scale privatization, which formed the foundation for development of the new, small-business sector. With the exception of Belarus, all countries represented in Table 1.1 had implemented a "nearly comprehensive program" of small-scale privatization (a score of 3 on the EBRD Index of Small-Scale Privatization) by 1999. Indeed, on average progress in small-scale privatization was larger in the former Soviet Union than was progress with large-scale privatization in Eastern Europe.

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[9]Akhmedov *et al* (2002) discusses the importance of public expenditures in determining regional electoral outcomes in Russia.

In contrast, the aggregate revenue figures reported in Table 1.1 suggest the possibility that $\frac{T_O}{T_N}$ was substantially higher in the eastern half of the postcommunist world. Collecting taxes has been a particular problem in the former Soviet Union, with tax collection averaging 27 percent of GDP among CIS members in 1999, whereas by and large the countries of Eastern Europe and the Baltics have had fewer difficulties meeting their revenue needs, extracting 37 percent of GDP on average as taxes.[10] Again, Belarus is the exception to the rule, as the virtual absence of large-scale privatization in that country, together with the maintenance of various institutions of state power, has allowed the state to continue to collect taxes at Soviet-era levels. Lower tax collection overall, if affecting all sectors equally, will result in a higher $\frac{T_O}{T_N}$ if $T_O > T_N$: defining $T_O = T + t$ and $T_N = T$, a decline in T increases $\frac{T_O}{T_N}$.

To more carefully test the proposition that new firms are especially hard to tax in the former Soviet Union, we use firm-level data from the BEEPS survey of enterprises carried out in 1999 by the World Bank and EBRD in the 23 postcommunist countries listed in Table 1.1. As discussed above in Chapter 2, firms in the survey, of which slightly more than half are *de novo* enterprises, were asked, "What percentage of sales of a typical firm in your area of activity would you estimate is reported to the tax authorities, bearing in mind difficulties in complying with taxes and other regulations?" If one accepts that respondents answer based on their personal expe-

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[10]The literature is unanimous in its view that the lower revenue figures in the former Soviet Union are due to the state's inability to collect taxes, and not to any greater desire on the part of the general population to limit government expenditures. See, e.g., Hemming *et al* (1995), Ebrill and Havrylyshyn (1999), or Schaffer and Turley (2000).

rience, as is typically assumed when sensitive questions are posed in this way, then this is a rough measure of the degree to which firms are taxable: firms which find it easier to hide revenues, perhaps because they are more likely to deal in cash or because government officials are less familiar with their operations, will report less of their revenues to tax authorities.

Table 3.1 presents results of three regressions of this measure of taxability on various firm characteristics, including dummies for *de novo* status and location in the former Soviet Union (less the Baltics).[11] While there is a great deal of noise in the data, the impact of *de novo* status is quite precisely estimated, as can be seen from the results of the first model. New firms in Eastern Europe and the Baltics report three percentage points more of their revenues to tax authorities than do old firms, while the reverse is the case in the former Soviet Union. (The linear combination of the *de novo* dummy and its interaction with the dummy for presence in the former Soviet Union is statistically significant at the 5 percent level.)

Why might new firms be especially difficult to tax in the former Soviet Union? Generally speaking, there are two possibilities: states may find it difficult to tax such firms because of their novelty *per se*, or because of some characteristic which these firms share. As mentioned above, the one characteristic common to almost all new enterprises in the postcommunist world is small size. Of the *de novo* firms in the

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[11]In all regressions, enterprises which are joint ventures between domestic and foreign firms are dropped from the sample: while generally "new" in postcommunist countries, joint ventures are fundamentally different from the *de novo* domestic firms which are the focus here. There is no substantial difference in results if instead joint ventures are included and classified as new.

sample, fully 85 percent have fewer than 100 employees (vs. 32 percent of old firms). The second model presented in Table 3.1 regresses revenue reporting on the log of employment and its interaction with presence in the former Soviet Union. Across the postcommunist world, small firms report less of their revenues to tax authorities, presumably because their size makes it easier for them to deal in cash, or because it is easier to remain below the radar screen of tax authorities when a firm is small. However, this effect is especially pronounced in the former Soviet Union, where the effect of size is twice as large as that in Eastern Europe. As in the first model, marginal effects are quite large.

The third model jointly tests the impact of novelty and size, including the *de novo* dummy and log of employment, and the interaction of both with the location dummy. Both interaction terms are statistically significant, and both sizeable. Thus, governments in the former Soviet Union seem to find it harder to tax *de novo* firms both because they are small and because they are new.

As to why novelty and size might be particular problems for tax collection in the former Soviet Union, at least three possibilities present themselves:

- One-company towns: Relative to Eastern Europe, the economic landscape of the Soviet Union seems to have been disproportionately populated by cities with a single or a few large enterprises, many located far from any other population center.[12] In such an environment, given a fixed cost of collecting taxes from

[12]This is certainly the conventional view, though little cross-national work has been done. On Russia, see Brown *et al* (1994), Expert Institute (2000), and Andrienko and Guriev (2002).

any given enterprise, the relative cost of collecting taxes from old enterprises will be particularly low.[13] In contrast, the more diverse economic geography of Eastern Europe may have reduced the incentive to concentrate on a few old enterprises.

- Banks: While doing business in cash helps a firm to avoid tax obligations, holding cash is costly. The opportunity cost of holding cash depends on the benefits of instead maintaining bank deposits, which will be greater where financial markets are well developed, as well as on firm-specific characteristics, such as size and industrial sector. Across the region, large firms may find it impossible to avoid the banking sector. However, given the better development of financial markets in Eastern Europe (Berglof and Bolton 2002), small firms in those countries may be less likely to deal in cash, and thus more likely to pay their taxes.

- Low-hanging fruit and short fruit pickers: Limited administrative capacity and the scale of state collapse in general may have led tax officials in the former Soviet Union to concentrate their resources on entities which they know how to and can tax. Thus, recent entrants – never having been part of the state planning apparatus, and engaged in relatively novel business activity – may be more likely to be neglected.

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[13]This effect may be exaggerated if local politicians are largely responsible for the local business environment, and if such politicians cut deals with large local firms to protect them from federal taxes in return for larger payments – perhaps in kind – to the regional budget (Treisman 1999, Sonin 2003).

In all likelihood, some combination of these and other factors is behind the quite different relative taxability of new and old firms in Eastern Europe and the former Soviet Union. Whatever the reasons, the fact that $\frac{T_O}{T_N}$ was considerably higher in the latter may have encouraged different patterns of support for new and old businesses across the region, which together with factor mobility, contributed to the great divide in state performance and factor allocation that had developed by the late 1990s.

3.4 Discussion and Extensions

A number of simplifying assumptions were made in developing the model presented in Section 3.2. This section considers the impact of relaxing those assumptions, and examines the welfare implications of the model. As will be seen, the assumption that state support is not financed from public funds is unimportant, while the assumptions that production may not take place without state support and that there are perfect economies of scale in the provision of that support may be partially relaxed without any qualitative change in results. Further, the old equilibrium – while possibly inefficient – may be second-best if the state would provide little support in the new equilibrium.

3.4.1 Tax-Financed Public Goods

In Section 3.2, we assumed that state support is provided at no cost to the public treasury, but is costly to the state for other reasons. This is plausible if one assumes that state support entails the expenditure of time or energy monitoring lower-level bureaucrats, or involves an opportunity cost in terms of rents foregone or other political priorities not pursued. However, other forms of support might require the expenditure of public funds, as when encouraging bureaucratic compliance necessitates increasing government wages. Thus, a natural question is whether the results in Section 3.2 depend on the assumption that support is provided by the state at no cost to the public treasury. The answer is no.

Consider the following alternative model. Rather than providing support e_O and e_N at cost $c(e_O + e_N)$, the state uses tax revenues to produce public goods which improve the productivity of labor. In particular, the state chooses a proportion λ_O of total public-goods production q (to be defined shortly) to be allocated to public goods useful in the old sector alone, with the remaining proportion $\lambda_N = 1 - \lambda_O$ benefiting the new sector only.[14] Thus, production in sector S is $Y_S = \alpha_S L_S \lambda_S q$.

Obviously, if the state is motivated by the desire to produce tax revenues, not all tax revenues will be used to provide public goods. Let β be the (endogenous) proportion of tax revenues kept by the state, with proportion $(1 - \beta)$ spent on public-

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[14]In an extended model, we might further assume that some proportion of public-goods production benefits both sectors. The results of this section will be more likely to hold, the smaller is that proportion.

goods production. Thus, total spending on public goods is $(1 - \beta)(T_O\alpha_O L_O(\lambda_O q) + T_N\alpha_N L_N(\lambda_N q))$. Further, assume that the state produces public goods according to a concave production technology, so that total provision of public goods is:

$$q = [(1 - \beta)(T_O\alpha_O L_O(\lambda_O q) + T_N\alpha_N L_N(\lambda_N q))]^\gamma \tag{3.5}$$

where $\gamma \in (0, 1)$. Thus,

$$q = [(1 - \beta)(T_O\alpha_O L_O\lambda_O + T_N\alpha_N L_N\lambda_N)]^{\frac{\gamma}{1-\gamma}} \tag{3.6}$$

The state solves for the optimal proportion of taxes retained β and allocation λ_O and λ_N across sectors of public-goods production:

$$\max_{\lambda_O, \lambda_N, \beta} \beta T_O\alpha_O L_O(\lambda_O q) + \beta T_N\alpha_N L_N(\lambda_N q) \tag{3.7}$$

$$\text{s.t.} \quad q = [(1 - \beta)(T_O\alpha_O L_O\lambda_O + T_N\alpha_N L_N\lambda_N)]^{\frac{\gamma}{1-\gamma}}$$

$$\text{and } \lambda_O + \lambda_N = 1$$

or

$$\max_{\lambda_O, \beta} \beta(1 - \beta)^{\frac{\gamma}{1-\gamma}}(T_O\alpha_O L_O\lambda_O + T_N\alpha_N L_N(1 - \lambda_O))^{\frac{1}{1-\gamma}} \tag{3.8}$$

Labor's problem is analogous to that in Section 3.2.

Proposition 6 *In the model with tax-financed public goods, there are three equilibria:*

1)   Old equilibrium: $L_O^* = 1$, $L_N^* = 0$, $\lambda_O^* = 1$, $\lambda_N^* = 0$, $\beta^* = 1 - \gamma$.

2)   New equilibrium: $L_N^* = 1$, $L_O^* = 0$, $\lambda_N^* = 1$, $\lambda_O^* = 0$, $\beta^* = 1 - \gamma$.

3)   Intermediate equilibrium: $\frac{L_N^*}{L_O^*} = \frac{T_O\alpha_O}{T_N\alpha_N}$, $\frac{\lambda_N^*}{\lambda_O^*} = \frac{(1-T_O)\alpha_O}{(1-T_N)\alpha_N}$, $\beta^* = 1 - \gamma$.

Proof. By inspection, (3.8) can be separated into two separate maximization problems: one over λ_O, and one over β. With respect to λ_O, the state will find it optimal to allocate all public goods to the old sector if $T_O \alpha_O L_O > T_N \alpha_N L_N$, all to the new sector if $T_O \alpha_O L_O < T_N \alpha_N L_N$, and will be indifferent if $T_O \alpha_O L_O = T_N \alpha_N L_N$. Similarly, labor's decision will depend on whether $(1 - T_O) \alpha_O \lambda_O$ is greater or less than $(1 - T_N) \alpha_N \lambda_N$. As in Section 3.2, these imply two extreme equilibria and an intermediate equilibrium defined by the indifference condition for each player.

To see that $\beta^* = 1 - \gamma$, note that $\beta(1 - \beta)^{\frac{\gamma}{1-\gamma}}$ is quasiconcave over $\beta \in [0, 1]$ for $\gamma \in (0, 1)$ (and concave for $\gamma \leq \frac{1}{2}$). Hence, the first-order condition $\beta^* = 1 - \gamma$ defines a maximum over $\beta \in [0, 1]$. ∎

The most important thing to note about Proposition 6 is that the equilibria look very similar to those in Proposition 5. As before, there are two extreme equilibria and an intermediate equilibrium. Further, the allocation of public goods across sectors in the intermediate equilibrium is identical to the allocation of support in Section 3.2, as is the division of labor between the old and new sectors. Thus, our arguments about the impact of relative taxability of the two sectors on the likelihood that the economy will tip into the new equilibrium do not depend on the assumptions in the model in Section 3.2 about costliness of state support.

In addition, Proposition 6 tells us what proportion of public funds a state will spend on the production of public goods, and what proportion will be skimmed off for personal use. As Proposition 6 shows, the share retained by the state is decreasing

in γ. In essence, the better is the public-goods production technology, the more the state will be motivated to take a small slice of a large pie rather than a large slice of a small pie.

3.4.2 Necessity of Government Support

In Section 3.2, the production function $Y_S = \alpha_S L_S e_S$ assumed that production is impossible without state support. The extent to which that assumption holds will depend on the political-economic environment and the definition of "support." For example, private economic activity of any real scale in postcommunist states required legislation and decrees liberalizing prices and trade. At the same time, many state-owned enterprises were able to continue operating in the absence of any change in government policy.

To capture variation in the necessity of state support, consider a modified production function $Y_S = \alpha_S L_S(\bar{e}_S + e_S)$, with $\bar{e}_S$ exogenous. The parameter $\bar{e}_S$ might reflect the stock of support inherited from a previous government, or could capture technological considerations which determine the extent to which production is possible without state intervention to create markets or restrain rent-seeking behavior among bureaucrats. As the following proposition shows, if $\bar{e}_S$ is sufficiently high (relative to $\bar{e}_{-S}$), then there is no multiplicity of equilibria. The unique equilibrium is that in which state support and factors of production are allocated to the sector with relatively high preexisting "support."

Proposition 7 *In the model with $\bar{e}_O, \bar{e}_N \geq 0$, the old equilibrium will be the unique equilibrium if:*

$$(1 - T_O)\alpha_O \bar{e}_O > (1 - T_N)\alpha_N[\bar{e}_N + f(T_N \alpha_N)] \tag{3.9}$$

while the new equilibrium will be the unique equilibrium if:

$$(1 - T_N)\alpha_N \bar{e}_N > (1 - T_O)\alpha_O[\bar{e}_O + f(T_O \alpha_O)] \tag{3.10}$$

Proof. Without less of generality, consider the case of uniqueness of the old equilibrium. Assume to the contrary that there are multiple equilibria when $(1 - T_O)\alpha_O \bar{e}_O > (1 - T_N)\alpha_N[\bar{e}_N + f(T_N \alpha_N)]$. Then a new equilibrium will exist in which $L_N = 1$, with state support defined by $f(T_N \alpha_N)$. Labor will then find it optimal to remain in the new sector so long as $(1 - T_N)\alpha_N[\bar{e}_N + f(T_N \alpha_N)] \geq (1 - T_O)\alpha_O \bar{e}_O$, which by assumption is false. Thus, the new equilibrium does not exist. Nonexistence of the intermediate equilibrium immediately follows. ■

Proposition 7 says that an equilibrium will not exist if even full allocation of labor to a sector does not produce sufficient state support to keep labor from migrating to the other sector. That will be more likely, the more productive is the other sector in the absence of state support.

How are the predictions of the basic model affected by Proposition 7? The general conclusion of the analysis in Section 3.2 is that movement from an old to a new equilibrium will be difficult if $T_O > T_N$. Under certain conditions, that result is strengthened by Proposition 7. As the following corollary indicates, if support is

more important for a new, low-taxability sector than an old, high-taxability sector, then the mere existence of the new equilibrium will be threatened by low taxability overall:

Corollary 2 *If $T_O > T_N$, and if support is necessary for production to take place in the new but not the old sector, i.e. $\bar{e}_N = 0$ and $\bar{e}_O > 0$, then a sufficiently large decline in taxability affecting both sectors equally (i.e. a reduction of k in both T_O and T_N) will render the old equilibrium unique.*

Proof. Define $T \equiv T_N$, $t = T_O - T_N$, and $y = (1 - T_O)\alpha_O\bar{e}_O - (1 - T_N)\alpha_N[\bar{e}_N + f(T_N\alpha_N)]$. As $T \to 0$, $y \to (1 - t)\alpha_O\bar{e}_O$, which is clearly greater than zero. Thus, according to Proposition 7, the old equilibrium is unique. ∎

By assumption, the old sector can operate in the absence of state support, while the new sector cannot. Thus, low taxability overall, while reducing the incentive of the state to support either sector, makes the new sector especially unattractive. In the context of postcommunist political economy, Corollary 2 says that the transition to a new economy in the former Soviet Union may have been especially difficult due to states' general inability to collect taxes from any sector of the economy, their particular inability to tax the new economy, and the greater necessity of state support for new economic activity to take place.

3.4.3   Economies of Scale in Provision of State Support

In positing the production function $Y_S = \alpha_S L_S e_S$ and state cost function $c = c(e_O + e_N)$, the model in Section 3.2 implicitly assumed perfect economies of scale in the provision of state support, i.e. for a single unit of labor the marginal productivity of state support is independent of the size of the sector being supported. Thus, for example, the model assumes that the cost of monitoring bureaucratic compliance with laws regulating inspections is independent of the size of the sector being inspected.

In fact, while there will typically be economies of scale in providing the sort of support envisioned in this paper – passage of legislation, monitoring of lower-level bureaucrats, etc. – the assumption of perfect economies of scale is strong. To examine the extent to which the conclusions of the model depend on this assumption, consider the production function $Y_S = \alpha_S L_S[\sigma e_S + (1 - \sigma)\frac{e_S}{L_S}]$. The parameter σ captures in a simple way the degree to which economies of scale are present in the provision of state support, i.e. the extent to which the state is able to stretch a given expenditure of time, energy, etc. across an entire sector. If $\sigma = 1$, then there are perfect economies of scale, and the model is identical to that in Section 3.2. If $\sigma = 0$, then there are no economies of scale. In this case, $Y_S = \alpha_S e_S$, and for a given level of state support e_S the direct impact of an increase in labor allocation is completely offset by the fact that state support is now less effective for any unit of labor.

Further, for technical reasons, assume that an infinitesimally small proportion ϵ of total labor supply remains in each of the two sectors regardless of where it is optimal

for labor to locate. Thus, total production in a sector is $Y_S = \sigma \alpha_S L_S e_S + (1-\sigma)\alpha_S e_S$, where the second term is well defined because we assume that L_S can approach but not equal zero. We then have the following proposition:

Proposition 8 *In the model with variable economies of scale in provision of state support, there will be multiple equilibria if and only if* $(1 - \sigma) \leq \min(\frac{T_O \alpha_O}{T_N \alpha_N}, \frac{T_N \alpha_N}{T_O \alpha_O})$. *When there is a unique equilibrium, it will be the equilibrium in support of sector S, where S satisfies $T_S \alpha_S > T_{-S} \alpha_{-S}$.*

Proof. Labor optimizes as in Section 3.2. To see whether an extreme equilibrium S exists, we must check whether the state will allocate support to sector S when $L_S \to 1$. Thus, the old equilibrium will exist when $T_O[\sigma \alpha_O + (1-\sigma)\alpha_O] \geq T_N(1-\sigma)\alpha_N$, i.e. when $(1-\sigma) \leq \frac{T_O \alpha_O}{T_N \alpha_N}$. Similarly, the new equilibrium will exist when $(1-\sigma) \leq \frac{T_N \alpha_N}{T_O \alpha_O}$. Since $(1-\sigma) \leq 1$, at least one of these conditions will always be met, and in particular when there is a unique equilibrium the sector S supported will satisfy $\frac{T_S \alpha_S}{T_{-S} \alpha_{-S}} > 1$. ∎

Proposition 8 states that multiple equilibria will be more likely when economies of scale are large, i.e. when σ is high. To see why this is the case, recall the logic of the model in Section 3.2. Labor chooses to locate in a sector because of state support, but the state in turn chooses to support a sector because it is large and taxable. If increased labor allocation to a sector does little to increase the taxable revenues produced by that sector (because, when economies of scale are small, the direct effect of increased labor allocation is offset by the reduced effectiveness of a given level of state support for any individual unit of labor), then this logic disappears.

That said, multiple equilibria may be possible even when economies of scale are small if $T_O \alpha_O$ is close to $T_N \alpha_N$. Given that it will often be the case that $T_O > T_N$ but $\alpha_O < \alpha_N$, we may expect that the existence of multiple equilibria will not typically be challenged by limited economies of scale in the provision of state support.

3.4.4 Welfare

While the new sector is perhaps inherently more productive than the old sector, the new equilibrium does not necessarily dominate the old equilibrium from an efficiency point of view. Rather, any inherent productivity advantage must be weighed against the fact that the state will provide less support in the new equilibrium if the new sector is considerably less taxable.

Formally, welfare in the equilibrium in support of sector S can be defined as:

$$W_S = \alpha_S f(T_S \alpha_S) - c(f(T_S \alpha_S)) \tag{3.11}$$

where we consider only the incentive effects of taxation, implicitly assuming that the state values tax revenues as would labor had those taxes not been collected.[15] W_S is increasing in α_S (both because α_S increases production directly and because it improves state incentives) and T_S (for the latter reason only).[16] Thus, even if $\alpha_N > \alpha_O$, if $T_O >> T_N$, the old equilibrium may be preferable.

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[15] We could alternatively assume that taxation involves a welfare loss of some sort without detracting from the main point of this section. See Corollary 1.

[16] For example, $\frac{\partial W_S}{\partial \alpha_S} = f(T_S \alpha_S) + T_S f'(T_S \alpha_S)[\alpha_S - c'(f(T_S \alpha_S))]$, where $\alpha_S - c'(f(T_S \alpha_S)) > 0$ since by the government's first-order condition $T_S \alpha_S - c'(f(T_S \alpha_S)) = 0$. The derivation for $\frac{\partial W_S}{\partial T_S}$ is analogous.

Thus, an economy cursed by government reliance on highly taxable natural re-sources may nonetheless be preferable to one in which resources are allocated to a sector that the state exclusively, but only weakly, supports. Of course, as Section 3.2 showed, movement from the former to the latter may be a rare phenomenon indeed.

In a world in which state behavior is driven primarily by revenue concerns, the ideal is when the new economy exhibits both greater inherent productivity and greater taxability. This not only increases the odds of a successful transition to a new equilibrium, but assures that the new equilibrium provides greater welfare. The advent of township-village enterprises in China – which not only benefitted from state support due to their high (local) taxability, but may also have been inherently more productive than the traditional industrial and agricultural sectors – seems to meet these conditions (Oi 1992, Che and Qian 1998, Jin and Qian 1998).

The downside is that the control of local governments over TVEs – which is what provides for their taxability - carries its own inefficiencies, so that α_N is probably not so great there as in, say, Poland. The fact that TVEs and similar firms are easier to tax, by the logic of this paper, means that they will be harder to dislodge by truly private competitors. Today's new equilibrium may become tomorrow's old.

Table 3.1: Determinants of Revenue Reporting - OLS Regressions
(Significance levels: 10% - *; 5% - **; 1% - ***)

Dependent Variable: Percent of Revenues Reported to Tax Authorities

	Estimated coefficient	Robust std. error	Estimated coefficient	Robust std. error	Estimated coefficient	Robust std. error
De novo firm	3.40**	1.35			1.68	1.43
De novo * CIS	-6.79***	1.74			-3.67*	2.10
CIS	-1.11	1.31	-14.05***	2.59	-9.58**	3.80
Log employment	2.90***	0.36	1.84***	0.36	2.11***	0.43
Log employment * CIS			2.35***	0.58	1.70**	0.70
Degree of competition	-4.06***	0.62	-3.97***	0.62	-4.09***	0.62
Transportation sector	-4.13**	2.02	-3.82*	2.01	-4.18**	2.02
Personal-service sector	-3.09	2.12	-3.31	2.12	-3.24	2.11
Wholesale sector	-1.75	1.47	-1.52	1.46	-1.65	1.47
Other sector	-1.33	3.31	-1.07	3.26	-1.26	3.27
Retail sector	0.23	1.47	0.53	1.46	0.37	1.47
Construction sector	0.82	1.55	0.65	1.54	0.64	1.55
Resource sector	0.97	1.54	0.42	1.55	0.50	1.55
Business-service sector	1.91	1.96	1.50	1.98	1.71	1.97
Finance sector	9.67***	2.46	10.14***	2.45	9.90***	2.46
Constant	80.95***	2.76	86.72***	2.68	85.15***	3.11
N	3371		3388		3371	
R^2	.066		.066		.068	

Notes: Omitted category for sector dummies is manufacturing sector. Town-size dummies included in all regressions.

Chapter 4

Elections

4.1 Introduction

Special interests - defined here as "any identifiable group of voters with similar preferences on a subset of policy issues" (Grossman and Helpman 2001, p. 1) - may influence government policy in a number of ways. If such groups are organized, they may undertake lobbying activity on behalf of their members, or may make campaign contributions to candidates who can credibly promise to pursue certain policies after an election. Policy will tend to be biased in favor of groups which are well organized, perhaps because collective action is easier in some economic sectors than others (Frieden 1991, Alt *et al* 1996). Alternatively, politicians who are able to make credible campaign promises may promise more to groups whose members share traits which make them politically important, such as a high propensity to vote, even

if those groups are disorganized.[1]

This chapter demonstrates that policy bias in favor of some disorganized special interests at the expense of others may arise even when campaign promises are incredible. In particular, the model presented below demonstrates that elected politicians may have an incentive to allocate support for economic sectors based on their "taxability," i.e. the ease with which revenues can be collected from the state. "Support" in this chapter is defined as any activity taken by the state which increases economic productivity and ultimately tax revenues, so long as that activity is costly in some way to elected politicians. Such support might take one of two forms: First, the state might provide a "helping hand" by enforcing contracts, creating the necessary legal infrastructure for markets to exist, and otherwise proactively encouraging economic activity. Second, politicians might restrain the state's "grabbing hand" by reining in lower-level bureaucrats who would otherwise be inclined to extract rents from economic actors, or by bearing the opportunity cost of foregoing such rents themselves.[2] Subsidies would not normally qualify as "support," as their provision does not typically result in a net revenue gain to the state.

The model presented in Section 4.2 below follows Holmstrom's (1982) formalization of the idea that "career concerns" can motivate managers to exert effort in an

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[1]See Grossman and Helpman (2001) for a review of models in the group-voting literature, as well as special-interest politics more generally. Note that many models in the group-voting literature assume some organization of the group which facilitates turnout (e.g., Morton 1987, 1991; Uhlaner 1989), but that this is not essential for differences in propensity to vote and thus policy bias to occur.

[2]The helping-hand/grabbing-hand metaphor is from Shleifer and Vishny (1998).

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 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 chapter is also unusual in that it involves conflicts of interest among voters (principals).

More generally, this chapter shares with some 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 model, 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 economic activity. As discussed in Chapter 2, 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 also plays a role.

Beyond reinforcing the general proposition that differences in taxability result in

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

unequal allocation of political support across economic sectors, the model in this chapter 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 over-all 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 ca-pacity) 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.

Section 4.3 empirically examines several predictions of the model presented in Section 4.2, using data from the BEEPS survey of firms in twenty-three postcommu-

nist states, where special interests are typically disorganized and the credibility of campaign promises may be diminished by the youth and weakness of political parties and other reputational mechanisms. First, consistent with this model but also with a model featuring a revenue-maximizing state rather than an elected politician, firms which are more taxable do indeed receive more support along a number of dimensions. More specific to this chapter, 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. Further, 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 chapter. 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 non-electoral considerations are behind the propensity of state officials in less democratic countries to provide disproportionate support to highly taxable firms.

4.2 Theory

4.2.1 Model With Redistributive Transfers

Consider an incumbent politician who must decide how much support to provide to each of two economic sectors, and whose reelection depends on voters' perceptions of his competence in supporting economic activity and in providing redistributive transfers and public goods valued by voters. Most obviously, this is an elected local or regional politician from the executive branch of government with some degree of control over the relevant business environment, though depending on the political-economic context the model may also describe the behavior of other political actors.

One interpretation of the support provided by the politician is that economic activity needs a legal infrastructure of some sort to thrive. Even the most liberal political theorist will argue for the role of the state in enforcing contracts. Further, legislation may be necessary to create markets, as when 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 economic activity involves an opportunity cost in that other issues important to the politician may receive less attention.

An alternative interpretation 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 subordinates[5] - the politician can reduce the level of bureaucratic interference. This is the "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, 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.

Critically, the two economic sectors which may potentially benefit from state 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 socialist economies, these two means of collecting revenues were often conflated, and 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 *high-taxability sector*.

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[4]Guriev (2002) develops a model to show how corruption can lead to more "red tape."

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

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. In addition to ownership, taxability may be influenced by such factors as firm size, sector of activity, and general institutional environment (see Chapter 2). 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 model, 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 govern-

ment. 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 receives 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.[6] (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

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[6]The 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.

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 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 $f(.)$ and distribution function $F(.)$ 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 directly, 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:

$$N_R \cdot g_t = N_L T_L (e_{Lt} + \theta_L) + N_H T_H (e_{Ht} + \theta_H) \tag{4.1}$$

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:

$$E(\text{transfers/post-tax profits} \mid \text{incumbent reelected})$$

$$\geq \quad \delta_i + E(\text{transfers/post-tax profits} \mid \text{challenger elected}) \tag{4.2}$$

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 economic 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 over $[-\frac{1}{2}, \frac{1}{2}]$ rather than over $[-\frac{1}{2\gamma_s}, \frac{1}{2\gamma_s}]$, but that voters in different groups attach different levels of importance to state support of economic activity (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:

$$\gamma_s E(\text{transfers/post-tax profits} \mid \text{incumbent reelected})$$

$$\geq \quad \delta_i + \gamma_s E(\text{transfers/post-tax profits} \mid \text{challenger elected}) \qquad (4.3)$$

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.[7]

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 4.1.

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[7]The 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 $\gamma_R(\gamma_L - \gamma_H) - (T_H - T_L)(\gamma_R - \gamma_H)(\gamma_R - \gamma_L) < 0$.
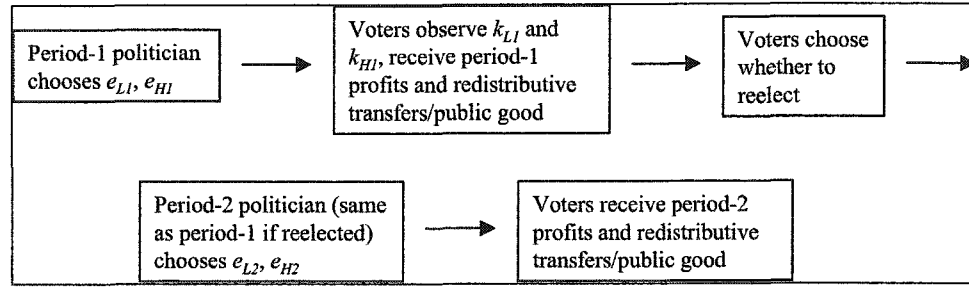
Figure 4.1: Timing of Events

4.2.2 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:

$$\max_{e_{L2}, e_{H2}} R - c(e_{L2}) - c(e_{H2}) \tag{4.4}$$

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:

$$\max_{e_{L1}, e_{H1}} R - c(e_{L2}) - c(e_{H2}) + \Pr(\text{win} \mid e_{L1}, e_{H1})R \qquad (4.5)$$

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:

$$(1 - T_L)(e_{L2}^* + \tilde{\theta}_L) \geq \delta_i + (1 - T_L)(e_{L2}^*) \qquad (4.6)$$

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:

$$\delta_i \leq (1 - T_L)\tilde{\theta}_L \tag{4.7}$$

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:

$$\frac{1}{2} + \gamma(1 - T_L)\tilde{\theta}_L \tag{4.8}$$

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:

$$\delta_i \leq (1 - T_H)\tilde{\theta}_H \tag{4.9}$$

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

$$\frac{1}{2} + \gamma(1 - T_H)\tilde{\theta}_H \tag{4.10}$$

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 (4.1), 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:

$$\delta_i \leq \frac{1}{N_R}(N_L T_L \tilde{\theta}_L + N_H T_H \tilde{\theta}_H) \tag{4.11}$$

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:

$$\frac{1}{2} + \frac{\gamma_R}{N_R}(N_L T_L \tilde{\theta}_L + N_H T_H \tilde{\theta}_H) \tag{4.12}$$

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 (4.8), (4.10), and (4.12) 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 $\tilde{\theta}_H$:

$$\frac{1}{2} + [\gamma + T_L(\gamma_R - \gamma)]N_L\tilde{\theta}_L + [\gamma + T_H(\gamma_R - \gamma)]N_H\tilde{\theta}_H \tag{4.13}$$

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 (4.5). 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

$$\Pr[\frac{1}{2} + (Z_L N_L \tilde{\theta}_L + Z_H N_H \tilde{\theta}_H) \geq \frac{1}{2}] = \Pr(Z_L N_L \tilde{\theta}_L + Z_H N_H \tilde{\theta}_H \geq 0) \qquad (4.14)$$

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-equilbrium-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:

$$\tilde{\theta}_s = a \text{ if } k_{s1} > \tilde{e}_{s1} + a \tag{4.15}$$

$$\tilde{\theta}_s = -a \text{ if } k_{s1} < \tilde{e}_{s1} - a$$

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:

$$\bar{f}(c) \equiv \int_{-\infty}^{\infty} f(cx)f(x)dx \tag{4.16}$$

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

$$c'(e_{L1}^*) = \bar{f}(-\frac{Z_H N_H}{Z_L N_L})R \tag{4.17}$$

$$c'(e_{R1}^*) = \bar{f}(-\frac{Z_L N_L}{Z_H N_H})R$$

Proof. See appendix. ∎

Interpretation of Proposition 9 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.

4.2.3 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 distribution 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 9 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 10 *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 state 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* state 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 11 *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 12 *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.[8]

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[8]Karachinskii (2001, p. 47). Author's translation from the Russian.

Proposition 12, while reasonable, is not too surprising. The following proposition is initially more counterintuitive:

Proposition 13 *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 politician to support the high-taxability sector. But Proposition 13 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 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 14 *Define $T \equiv \frac{T_L + T_H}{2}$, $\Delta \equiv T_H - T_L$.[9] So long as $\gamma_R \neq \gamma$, support for*

_____

[9]Note that it does not matter where we "anchor" overall tax capacity, i.e. we can choose any T

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 state results in a reallocation of state support away

from the high-taxability sector towards the low-taxability sector. To see why this

is the case, recall from Proposition 11 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.

when by Proposition 11 taxability does not matter at all, does overall tax capacity

have no effect.

In other words, 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

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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.

other, even if absolute electoral returns have increased in both 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 "capped" in this model 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.[10]

Beyond any theoretical interest, the difference in state behavior implied by com-

paring 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

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[10]Perhaps 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 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 $T_L e_L + T_H e_H$ 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.

that provide high relatively levels of taxability may be optimal.

Proposition 15 *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 15 is closely related to Proposition 11: 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.

4.2.4 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:

$$g_t = (N_L + N_H)g_t = N_L T_L(e_{Lt} + \theta_L) + N_H T_H(e_{Ht} + \theta_H) \tag{4.18}$$

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:

$$(1 - T_L)(e_{L2}^* + \tilde{\theta}_L) + \alpha[N_L T_L(e_{Lt}^* + \tilde{\theta}_L) + N_H T_H(e_{Ht}^* + \tilde{\theta}_H)]$$

$$\geq \quad \delta_i + (1 - T_L)(e_{L2}^*) + \alpha[N_L T_L(e_{Lt}^*) + N_H T_H(e_{Ht}^*)] \tag{4.19}$$

i.e., if:

$$\delta_i \leq (1 - T_L)\tilde{\theta}_L + \alpha(N_L T_L \tilde{\theta}_L + N_H T_H \tilde{\theta}_H) \tag{4.20}$$

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

$$\frac{1}{2} + \gamma[(1 - T_L)\tilde{\theta}_L + \alpha(N_L T_L \tilde{\theta}_L + N_H T_H \tilde{\theta}_H)] \tag{4.21}$$

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:

$$\frac{1}{2} + [1 + T_L(\alpha - 1)]\gamma N_L \tilde{\theta}_L + [1 + T_H(\alpha - 1)]\gamma N_H \tilde{\theta}_H \tag{4.22}$$

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

$$\Pr[\frac{1}{2} + \gamma(z_L N_L \tilde{\theta}_L + z_H N_H \tilde{\theta}_H) \geq \frac{1}{2}] = \Pr(z_L N_L \tilde{\theta}_L + z_H N_H \tilde{\theta}_H \geq 0) \tag{4.23}$$

which is exactly analogous to the second term in (4.14). 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 16 *(Proposition 10 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 17 *In the public goods model, Propositions 11, 12, 14, and 15 hold, where the condition $\gamma_R \gtrless \gamma$ is replaced by the condition $\alpha \gtrless 1$.*

Proposition 13 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 16 and 17 show, the qualitative result is the same. The more individuals value the public good, the greater the incentive of the politician to obtain tax revenues to provide that good, which he 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 support. As before, an increase in the overall tax capacity of the state, i.e. an increase in $T \equiv \frac{T_L + T_H}{2}$ holding $\Delta \equiv T_H - T_L$ constant, encourages the politician to provide more support to the low-taxability sector.

4.3 Empirical Evidence

This section examines the impact of taxability on state support of economic activity in postcommunist countries. Among the legacies of socialism in these states is generally poor organization of special interests (the well-publicized "oligarchs" are the exception which proves the rule) and few institutional mechanisms to encourage politicians to keep their promises (political parties in particular are young and often weak).

Further, 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

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

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 1.1 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]

The empirical work in this section concentrates on three key implications of the model presented above: 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 to pay for them, then politicians will have an incentive to disproportionately support highly taxable economic activity (Propositions 11 and 17); 2) the allocation of political support across sectors is independent of the size of the population receiving redistributive transfers (Proposition 13); 3) the degree to

[12]Effective 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.

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

which highly taxable economic activity is favored is decreasing in the overall level of taxability in the country (Propositions 14 and 17).

We test these propositions using data from the 1999 World Bank/EBRD Business Environment and Enterprise Performance Survey (BEEPS), discussed in detail in Chapter 2. 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 tax evasion. In the empirical work below, we use revenue reporting as a proxy for the taxability of the firm. (See Chapter 2 for a theoretical and empirical justification of this assumption.) Further, we consider the impact of state ownership on state support of economic 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.

In addition, firm managers were asked to report on various aspects of state "support" (or lack thereof) of their business activity. In the regressions reported in this chapter, six separate variables are used as indicators of state support of economic 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 business-state 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 4.2 examines the first of three key implications of the model presented in Section 4.2. 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 4.2 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. This effect is very precisely estimated for all six measures of state support,

and marginal effects are substantial.[14]

Further, for four of the six measures of state support, state ownership is significantly associated with better treatment by state officials, even after controlling for the proportion of revenues reported. The likely explanation is that state firms are more "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 state 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 chapter 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 4.3 and 4.4 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 (thus assuming that retirement benefits are the only substantial form of government transfer) and the proportion of GDP collected as taxes by all levels of government of the country in which the firm resides, respectively.[15] (Revenue reporting is also interacted with the 1999

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[14]Marginal 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).

[15]Country dummies, which are included in the regressions reported in Table 2, are dropped from

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 4.3 reports results for the subsample of firms in countries rated as "free" according to their political rights and civil liberties by the nongovernmental organization Freedom House, while Table 4.4 presents results for firms in countries rated as "partially free" or "not free."

For almost every measure of state 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 13. 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 4.3 and 4.4 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 state support, the degree to which revenue reporting is a predictor of state support is decreasing in the proportion of GDP collected as tax revenues by all levels of government, and for four of

all subsequent regressions since each country represented in the dataset has a unique proportion of GDP collected as taxes.

those six measures the estimated coefficient on the interaction term is statistically significant from zero at the five percent level.[16] In contrast, there is no support for the proposition that country tax capacity influences the degree to which revenue reporting matters in "partially free" and "not free" countries. For five of the six regressions reported in Table 4.4, 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 state support is simply regressed on revenue reporting and covariates as in Table 4.2, 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 state officials. In other words, for those countries with poorly developed political rights and civil liberties, the empirical results of this section

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[16]The 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 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.

are inconsistent with the electoral-competition model presented in Section 4.2, 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 chapter assumes that democratic politics function in more-or-less "normal" fashion (or at least normal in the context of disorganized special interests and incredible campaign promises). 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.

4.4 Conclusion

This chapter has stressed the electoral incentive of politicians to support economic activity in an environment in which economic sectors differ according to their taxability. In so doing, it expands upon a basic intuition: when politicians care about taxes and sectors differ according to their taxability, then politicians will have an incentive to allocate support for economic 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.

The more general point, as discussed in the introduction, is that group-specific characteristics can produce policy bias even when those groups are disorganized and politicians lack commitment power. When campaign promises are incredible, perceptions of political competence based on past performance may be especially important. As in political business-cycle models, ignorance of the politician's competence encourages the politician to expend effort (support, in this model) in an attempt to appear more competent. Unlike political business-cycle models, competence in this model is multidimensional, so the politician must choose the proper allocation of effort across policy dimensions. That allocation depends on the mapping of effort into political outcomes, i.e. the degree to which different groups value competence in different policy arenas. In this model, differences in the taxability of economic activity across sectors influence relative electoral returns from the expenditure of effort. Future research may explore the impact of other characteristics.

In developing the model presented above, a number of simplifying assumptions were made. Some of these are discussed below in the context of issues common to all the models in this dissertation. Others are more specific to the model in this chapter. For example, the assumption of purely electoral incentives to increase tax

revenues is strong, and might be relaxed in future work to allow consideration of the use of 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 model), while simultaneously increasing the desire of politicians to be reelected. Further, the empirical results in Section 4.3 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.

4.5 Appendix

Proof of Proposition 9:

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 $\tilde{e}_{L1}$:

$$
\begin{aligned}
\tilde{\theta}_L &= -a \text{ if } k_{L1} < \tilde{e}_{L1} - a \\
&= k_{L1} - \tilde{e}_{L1} = e_{L1} + \theta_L - \tilde{e}_{L1} \text{ if } k_{L1} \in [\tilde{e}_{L1} - a, \tilde{e}_{L1} + a] \qquad (4.24) \\
&= a \text{ if } k_{L1} > \tilde{e}_{L1} - a
\end{aligned}
$$

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:

$$
\int_{-a}^{-a+\tilde{e}_{L1}-e_{L1}} I(-a \geq -\frac{Z_H N_H}{Z_L N_L}\tilde{\theta}_H) f(\theta_L) d\theta_L + \qquad (4.25)
$$
$$
\int_{-a+\tilde{e}_{L1}-e_{L1}}^{a} I(\theta_L + e_{L1} - \tilde{e}_{L1} \geq -\frac{Z_H N_H}{Z_L N_L}\tilde{\theta}_H) f(\theta_L) d\theta_L
$$

where $I(.)$ 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 (4.25) 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 (4.25), 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 (4.25) in terms of realizations of $\tilde{\theta}_H$, we have:

$$\int_{\tilde{\theta}_H < \frac{Z_L N_L}{Z_H N_H}a} [1 - F_{\theta_L}(\tilde{e}_{L1} - e_{L1} - \frac{Z_H N_H}{Z_L N_L}\tilde{\theta}_H)]f(\tilde{\theta}_H)d\tilde{\theta}_H + \int_{\tilde{\theta}_H \geq \frac{Z_L N_L}{Z_H N_H}a} 1 \cdot f(\tilde{\theta}_H)d\tilde{\theta}_H \quad (4.26a)$$

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:

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

$$(4.27)$$

Taken together, (4.26a) and (4.27) 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:

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

$$= \int f(-\frac{Z_H N_H}{Z_L N_L} \theta_H) f(\theta_H) d\theta_H \qquad (4.28)$$

$$= \bar{f}(-\frac{Z_H N_H}{Z_L N_L})$$

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.∎

Table 4.1: Effect of Revenue Reporting and Ownership on Government Support
(Significance levels: 10% - *; 5% - **; 1% - ***)

OLS Regressions

	Percent of Revenues Not Paid as Bribes		Percent of Revenues Not Paid as Non-Tax Bribes		Percent of Management Time Not Spent with Government Officials	
	Estimated coefficient	Robust std. error	Estimated coefficient	Robust std. error	Estimated coefficient	Robust std. error
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	
R²	.128		.108		.101	

Ordered-Probit Regressions

	Opportunity to Appeal Administrative Violations		Contracts and Property Rights Enforced		Local Government Helpful	
	Estimated coefficient	Robust std. error	Estimated coefficient	Robust std. error	Estimated coefficient	Robust std. error
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	

	Always (Pr = .10)	Mostly (Pr = .16)	Fully Agree (Pr = .06)	Agree in Most Cases (Pr = .15)	Very Helpful (Pr = .04)	Mildly Helpful (Pr = .18)
Marginal effects						
- 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.

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Table 4.2: 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 Not Paid as Bribes		Percent of Revenues Not Paid as Non-Tax Bribes		Percent of Management Time Not Spent with Government Officials	
	Estimated coefficient	Robust std. error	Estimated coefficient	Robust std. error	Estimated coefficient	Robust std. error
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	
R²	.130		.129		.032	

Ordered-Probit Regressions	Opportunity to Appeal Administrative Violations		Contracts and Property Rights Enforced		Local Government Helpful	
	Estimated coefficient	Robust std. error	Estimated coefficient	Robust std. error	Estimated coefficient	Robust std. error
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 4.3: 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 Not Paid as Bribes		Percent of Revenues Not Paid as Non-Tax Bribes		Percent of Management Time Not Spent with Government Officials	
	Estimated coefficient	Robust std. error	Estimated coefficient	Robust std. error	Estimated coefficient	Robust std. error
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 Administrative Violations		Contracts and Property Rights Enforced		Local Government Helpful	
	Estimated coefficient	Robust std. error	Estimated coefficient	Robust std. error	Estimated coefficient	Robust std. error
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.

Chapter 5

Conclusion

This dissertation has taken a simple idea – that politicians will tend to support economic activity which is more taxable – and developed it in various ways. As Chapters 2 through 4 show, the details of modeling matter: the extent to which, and even whether, state officials favor economic activity which is more taxable depends on such factors as the ability of politicians to commit to leaving economic actors with a portion of their unhidden production, the nature of economic activity in the untaxable "informal" sector, and the degree to which voters value the transfers and services provided by the state. Further, the impact of a bias towards more taxable activity will depend on the broader institutional environment, including the mobility of factors of production between sectors which differ in their taxability and the overall tax capacity of the state.

In developing and empirically exploring these arguments, a number of compro-

mises were made which suggest avenues for future research. Both theoretically and empirically, this dissertation has abstracted from what are in reality substantial differences across countries in the nature of tax systems and revenue sharing among different levels of government. The latter point is likely to be especially important to the degree that it is local officials who are largely responsible for creating a more or less positive business environment, and for whom the tax return to support of economic activity is consequently important. For example, while local governments in the Czech Republic, Hungary, and Poland all retain some tax revenues collected locally, the nature of their revenue base differs substantially, with personal income taxes relatively more important in the first two countries and real estate taxes more important in the third.[1] Similarly, empirical research has found substantial variation within Russia in the degree to which local governments retain any marginal increase in tax revenues (Makrushin *et al* 2002). The implication is that the taxability may interact in interesting ways with local fiscal incentives. In other words, there appear to be unrealized gains from trade between the literature on state-society relations to which this dissertation speaks, and that on fiscal federalism, which emphasizes instead relations between levels of government.

Further, future research might connect some of the dots between different components of the work here. Chapter 3, for example, stressed the importance of factor mobility to the impact of differences in taxability across sectors. Thus, a logical

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[1]See, e.g., the country reports in Horvath (2000). As discussed in Chapter 2, the measure of revenue reporting used in this paper likely captures to a considerable extent the evasion of many taxes not directly calculated from firm revenues.

extension to the model in Chapter 4, which also features two sectors, would be to consider the effect of differences in taxability in an explicitly electoral context. Similarly, the assumption that the politician in Chapter 4 is unable to commit in any way might be relaxed gradually, in the same way that the model in Chapter 2 explored gradations in commitment. Doing so may help us to better understand not only the impact of taxability on state support of economic activity, but also the role of commitment in political process more generally.

Bibliography

Acemoglu, Daron. 2002. "Why Not a Political Coase Theorem? Social Conflict, Commitment and Politics." Unpublished manuscript.

Acemoglu, Daron, Simon Johnson & James A. Robinson. 2001. "The Colonial Origins of Comparative Development: An Empirical Investigation." *American Economic Review* 91(5):1369–1401.

Acemoglu, Daron, Simon Johnson & James A. Robinson. 2003. "Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution." *Quarterly Journal of Economics* Forthcoming.

Akhmedov, Akhmed, Alexei Ravichev & Ekaterina Zhuravskaya. 2002. "Regional Political Cycles in Russia." Paper presented at the 2002 CEPR/WDI Annual International Conference on Transition Economics.

Alt, James E., Jeffry Frieden, Michael J. Gilligan, Dani Rodrik & Ronald Rogowski. 1996. "The Political Economy of International Trade: Enduring Puzzles and an Agenda for Inquiry." *Comparative Political Studies* 29:689–717.

Andrienko, Yuri & Sergei Guriev. 2002. "Determinants of Interregional Mobility in Russia: Evidence From Panel Data." CEFIR Working Paper.

Aslund, Anders, Peter Boone & Simon Johnson. 1996. "How to Stabilize: Lessons from Post-Communist Countries." *Brookings Papers on Economic Activity* 1:217–313.

Balcerowicz, Leszek. 1994. "Understanding Postcommunist Transitions." *Journal of Democracy* 5:75–89.

Barnes, Andrew. 2002. "Post-Soviet Russia as a Struggle for Property: Illuminating Changes in the Russian Political Economy Since 1998." Paper presented at the 2002 Annual Meeting of the American Political Science Association.

Berglof, Erik & Patrick Bolton. 2002. "The Great Divide and Beyond: Financial Architecture in Transition." *Journal of Economic Perspectives* 16(1):77–100.

Berkowitz, Daniel & Wei Li. 2000. "Tax Rights in Transition Economies: A Tragedy of the Commons?" *Journal of Public Economics* 76(3):369–398.

Boeri, Tito & Katherine Terrell. 2002. "Institutional Determinants of Labor Reallocation in Transition." *Journal of Economic Perspectives* 16:51–76.

Boycko, Maxim, Andrei Shleifer & Robert Vishny. 1995. *Privatizing Russia.* Cambridge, MA: MIT Press.

Brennan, Geoffrey & James M. Buchanan. 1980. *The Power to Tax: Analytical Foundations of a Fiscal Constitution.* Cambridge: Cambridge University Press.

Brown, Annette N., Barry W. Ickes & Randi Ryterman. 1994. "The Myth of Monopoly: A New View of Industrial Structure in Russia." World Bank Policy Research Working Paper.

CEFIR & World Bank. 2002. "Monitoring of Administrative Barriers to Small Business Development in Russia." CEFIR manuscript.

Central Intelligence Agency. 2000. *The World Factbook 2000.* Washington, DC: CIA.

Che, Jiahua & Yingyi Qian. 1998. "Insecure Property Rights and Government Ownership of Firms." *Quarterly Journal of Economics* 113(2):467–496.

Coase, Ronald. 1960. "The Problem of Social Cost." *Journal of Law and Economics* 3:1–31.

Cox, Gary W. & Mathew D. McCubbins. 1994. *Legislative Leviathan: Party Government in the House.* Los Angeles: University of California Press.

de Soto, Hernando. 1990. *The Other Path.* New York: Harper and Row.

Dewatripont, Mathias, Ian Jewitt & Jean Tirole. 1999a. "The Economics of Career Concerns, Part I: Comparing Information Structures." *Review of Economic Studies* 66:183–198.

Dewatripont, Mathias, Ian Jewitt & Jean Tirole. 1999*b*. "The Economics of Career Concerns, Part II: Application to Missions and Accountability of Government Agencies." *Review of Economic Studies* 66:199–217.

Earle, John, Roman Frydman, Andrzej Rapaczynski & Joel Turkewitz. 1994. *Small Privatization: The Transformation of Retail Trade and Consumer Services in the Czech Republic, Hungary, and Poland.* Budapest: CEU Press.

Earle, John S. & Scott Gehlbach. 2003. "A Spoonful of Sugar: Privatization and Popular Support for Reform in the Czech Republic." *Economics and Politics* 15(1):1–32.

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

EBRD. 2000. *Transition Report 2000: Employment, Skills and Transition.* London: European Bank for Reconstruction and Development.

EBRD. 2001. *Transition Report 2001: Energy in Transition.* London: European Bank for Reconstruction and Development.

Ebrill, Liam & Oleh Havrylyshyn. 1999. "Tax Reform in the Baltics, Russia, and Other Countries of the Former Soviet Union." IMF Occasional Paper No. 182.

Evans, Peter B., Dietrich Rueschemeyer & Theda Skocpol, eds. 1985. *Bringing the State Back In.* Cambridge: Cambridge University Press.

Expert Institute. 2000. *Monoprofil'nye Goroda I Gradoobrazuyushchie Predpriyatiya.* Moscow: Expert Institute.

Farrell, Joseph. 1987. "Information and the Coase Theorem." *Journal of Economic Perspectives* 1(2):113–129.

Fish, M. Steven. 1998*a*. "The Determinants of Economic Reform in the Post-Communist World." *East European Politics and Societies* 12(1):31–78.

Fish, M. Steven. 1998*b*. The Roots of and Remedies for Russia's Racket Economy. In *The Tunnel at the End of the Light: Privatization, Business Networks, and Economic Transformation in Russia*, ed. Stephen S. Cohen, Andrew Schwartz & John Zysman. Berkeley: IAS, University of California at Berkeley pp. 86–137.

Freedom House. 2002. *Freedom in the World: The Annual Survey of Political Rights and Civil Liberties, 2001-2002.* New Brunswick, NJ: Transaction Publishers.

Frydman, Roman & Andzrej Rapaczynski. 1994. *Privatization in Eastern Europe: Is the State Withering Away?* Budapest: CEU Press.

Frye, Timothy & Andrei Shleifer. 1997. "The Invisible Hand and the Grabbing Hand." *American Economic Review Papers and Proceedings* 87:354–358.

Frye, Timothy & Ekatherina Zhuravskaya. 2000. "Rackets, Regulation and the Rule of Law." *The Journal of Law, Economics, and Organization* 16(2):478–502.

Fudenberg, Drew & Jean Tirole. 1986. "A 'Signal-Jamming' Theory of Predation." *RAND Journal of Economics* 17(3):366–376.

Furubotn, Eirik G. & Rudolf Richter. 2000. *Institutions and Economic Theory: The Contribution of the New Institutional Economics.* Ann Arbor, MI: University of Michigan Press.

Gehlbach, Scott. 2001. "Social Networks and Corruption." Paper presented at the 2001 Annual Meeting of the American Political Science Association.

Gordon, Roger H. & David Li. 1997. "Taxes and Government Incentives: Eastern Europe Vs. China." University of Michigan Department of Economics Working Paper No. 97-05.

Gordon, Roger H. & John D. Wilson. 1999. "Tax Structure and Government Behavior: Implications for Tax Policy." Unpublished manuscript.

Gorsky, Mikael. 2001. "Accounting Reform in Russia: An Insider's Comments." *BISNIS Bulletin* February:3.

Greif, Avner, Paul Milgrom & Barry R. Weingast. 1994. "Coordination, Commitment, and Enforcement: The Case of the Merchant Guild." *Journal of Political Economy* 102(4):745–776.

Grossman, Gene M. & Elhanan Helpman. 2001. *Special Interest Politics.* Cambridge, MA: MIT Press.

Guriev, Sergei. 2002. "Red Tape and Corruption." New Economic School manuscript.

Gustafson, Thane. 1999. *Capitalism Russian-Style.* Cambridge: Cambridge University Press.

Havrylyshyn, Oleh & Donald McGettigan. 2000. "Privatization in Transition Countries." *Post-Soviet Affairs* 16:257–286.

Hellman, Joel. 1998*a*. "Winners Take All: The Politics of Partial Reform in Postcommunist Transition." *World Politics* 50:203–234.

Hellman, Joel S. 1998*b*. "Winners Take All: The Politics of Partial Reform in Postcommunist Transitions." *World Politics* 50(2):203–234.

Hellman, Joel S., Geraint Jones & Daniel Kaufmann. 2000. ""Seize the State, Seize the Day": State Capture, Corruption, and Influence in Transition." World Bank Policy Research Working Paper No. 2444.

Hellman, Joel S., Geraint Jones, Daniel Kaufmann & Mark Schankerman. 2000. "Measuring Governance, Corruption, and State Capture: How Firms and Bureaucrats Shape the Business Environment in Transition Economies." World Bank Policy Research Working Paper No. 2312.

Hemming, Richard, Adrienne Cheasty & Ashok K. Lahiri. 1995. The Revenue Decline. In *Policy Experiences and Issues in the Baltics, Russia, and Other Countries*

of the Former Soviet Union, ed. Daniel A. Citrin & Ashok K. Lahiri. IMF Occasional Paper No. 133.

Hendley, Kathryn, Peter Murrell & Randi Ryterman. 2001. Law Works in Russia: The Role of Legal Institutions in the Transactions of Russian Enterprises. In *Assessing the Value of Law in Transition Economies*, ed. Peter Murrell. Ann Arbor: University of Michigan Press pp. 56–93.

Holmstrom, Bengt. 1982. Managerial Incentive Problems - A Dynamic Perspective. In *Essays in Economics and Management in Honor of Lars Wahlbeck*. Helsinki: Swedish School of Economics.

Horvath, Tamas M., ed. 2000. *Decentralization: Experiments and Reforms*. Budapest: Local Government and Public Service Reform Initiative, Open Society Institute.

IMF. 1998. Progress with Fiscal Reform in Countries in Transition. In *World Economic Outlook*, ed. IMF. Washington: International Monetary Fund pp. 98–120.

Ivanenko, Vlad. 2001. "Effective Tax Rates in Transition." William Davidson Institute Working Paper No. 378.

Janos, Andrew. 2002. *East Central Europe in the Modern World: Political Change in the Borderlands from Pre- to Post-Communism*. Stanford: Stanford University Press.

Jin, Hehui & Yingyi Qian. 1998. "Public Vs. Private Ownership of Firms: Evidence from Rural China." *Quarterly Journal of Economics* 113(3):773–808.

Johnson, Simon, Daniel Kaufmann & Andrei Shleifer. 1998. "The Unofficial Economy in Transition." *Brookings Papers on Economic Activity* 2:159–239.

Johnson, Simon, John McMillan & Christopher Woodruff. 2000. "Entrepreneurs and the Ordering of Institutional Reform: Poland, Slovakia, Romania, Russia and Ukraine Compared." *Economics of Transition* 8(1):1–36.

Jones Luong, Pauline & Erika Weinthal. 2002. "Energy Wealth and Tax Reform in Russia and Kazakhstan." *Resources Policy* 27(4):1–9.

Karachinskii, Anatolii. 2001. Rossiiskii sektor informatsionnyx tekhnologii: problemy i perspektivy. In *Rossiya 2015: Dolgovremennaya Strategiya Rosta.* Moscow: EERC pp. 47–49.

Kodrzycki, Yolanda K. & Eric M. Zolt. 1994. "Tax Issues Arising From Privatization in the Formerly Socialist Countries." *Law and Policy in International Business* 25(2):609–637.

Lambert-Mogiliansky, Ariane, Konstantin Sonin & Ekatherina Zhuravskaya. 2000. "Capture of Bankruptcy: Theory and Evidence from Russia." CEFIR Working Paper.

Levi, Margaret. 1988. *Of Rule and Revenue.* Berkeley: University of California Press.

Lieberman, Evan S. 2001. "National Political Community and the Politics of Income Taxation in Brazil and South Africa in the Twentieth Century." *Politics and Society* 29(4):515–555.

Lohmann, Susanne. 1998. "Rationalizing the Political Business Cycle: A Workhorse Model." *Economics and Politics* 10(1):1–17.

MacFarquhar, Rory. 1997. "Taxes in Russia." *Russian Economic Trends Monthly Update* December.

Makrushin, Aleksei, Ekaterina Zhuravskaya, Irina Slin'ko & Ruben Enikolopov. 2002. "Prichiny I Sledstviia Slabosti Byudzhetnykh Stimulov V Rossii Na Mestnom Urovne." CEFIR manuscript.

Martinez-Vazquez, Jorge & Robert McNab. 2000. "The Tax Reform Experiment in Transitional Countries." Andrew Young School of Policy Studies Working Paper 00-1.

McDaniel, Tim. 1996. *The Agony of the Russian Idea.* Princeton: Princeton University Press.

Murphy, Kevin M., Andrei Shleifer & Robert W. Vishny. 1989. "Industrialization and the Big Push." *Journal of Political Economy* 97(5):1003–1026.

North, Douglass C. 1981. *Structure and Change in Economic History.* New York: W.W. Norton and Company.

Oi, Jean C. 1992. "Fiscal Reform and the Economic Foundations of Local State Corporatism in China." *World Politics* 45(1):99–126.

Persson, Torsten & Guido Tabellini. 2000. *Political Economics: Explaining Economic Policy.* Cambridge, MA: MIT Press.

Pop-Eleches, Christian. 1998. "Transition in Romania: Three Essays on Private Sector Development." Unpublished B.A. thesis, Harvard University.

Qian, Yingyi & Barry Weingast. 1996. "China's Transition to Markets: Market-Preserving Federalism, Chinese Style." *Journal of Policy Reform* 1(2):149–185.

Robinson, James A. 1998. "Theories of 'Bad' Policy." *Journal of Policy Reform* 3:1–46.

Roland, Gerard & Thierry Verdier. 1994. "Privatization in Eastern Europe: Irreversibility and Critical Mass Effects." *Journal of Public Economics* 54:163–183.

Roland, Gerard & Thierry Verdier. 1999. "Law Enforcement and Transition." William Davidson Institute Working Paper No. 262.

Rosenstein-Rodan, Paul N. 1943. "Problems of Industrialisation of Eastern and South-Eastern Europe." *Economic Journal* 53:202–211.

Sachs, Jeffrey D. & Katharina Pistor, eds. 1997. *The Rule of Law and Economic Reform in Russia.* Boulder, CO: Westview Press.

Schaffer, Mark E. & Gerard Turley. 2000. "Effective Vs. Statutory Taxation: Measuring Effective Tax Administration in Transition Economies." William Davidson Institute Working Paper No. 347.

Scheppele, Kim Lane. 1999. "The Inevitable Corruption of Transition." *Connecticut Journal of International Law* 14(2):509–532.

Schmidt, Klaus. 2000. "The Political Economy of Mass Privatization and the Threat of Expropriation." *European Economic Review* 44:817–868.

Shafer, D. Michael. 1994. *Winners and Losers: How Sectors Shape the Developmental Prospects of States*. Ithaca: Cornell University Press.

Shelley, Louise I. 2000. "Corruption in the Post-Soviet Era." *East European Constitutional Review* 9(1/2):70–74.

Shleifer, Andrei. 1997. "Government in Transition." *European Economic Review* 41(3-5):385–410.

Shleifer, Andrei & Robert W. Vishny. 1998. *The Grabbing Hand: Government Pathologies and Their Cures*. Cambridge, MA: Harvard University Press.

Skocpol, Theda. 1979. *States and Social Revolutions: A Comparative Analysis of France, Russia, and China*. Cambridge: Cambridge University Press.

Sonin, Konstantin. 2003. "Provincial Protectionism." CEFIR Working Paper.

Spruyt, Hedrik. 1994. "Institutional Selection in International Relations: State Anarchy as Order." *International Organization* 48(4):527–557.

Stoner-Weiss, Kathryn. 1997. *Local Heroes: The Political Economy of Russian Regional Governance.* Princeton: Princeton University Press.

Tanzi, Vito & George Tsibouris. 2000. "Fiscal Reform Over Ten Years of Transition." IMF Working Paper 00/113.

Tilly, Charles. 1990*a*. *Coercion, Capital, and European States.* Cambridge, MA: Blackwell.

Tilly, Charles. 1990*b*. *Coercion, Capital, and European States, AD 990-1990.* Cambridge, MA: Blackwell.

Treisman, Daniel. 1999. "Russia's Tax Crisis: Explaining Falling Tax Revenues in a Transitional Economy." *Economics and Politics* 11(2):145–169.

Treisman, Daniel. 2002. "Postcommunist Corruption." Unpublished manuscript.

Vogel, Steven K. 1996. *Freer Markets, More Rules: Regulatory Reform in Advanced Industrial Countries.* Ithaca: Cornell University Press.

Volkov, Vadim. 2000. "The Political Economy of Protection Rackets in the Past and the Present." *Social Research* 67(3):709–745.

Waller, Christopher J., Thierry Verdier & Roy Gardner. 2000. "Corruption: Top Down or Bottom Up?" InTranz Working Paper.

World Bank. 2002*a*. *Transition: The First Ten Years*. Washington: World Bank.

World Bank. 2002*b*. *Transition: The First Ten Years*. Washington, DC: World Bank.

Yakovlev, Andrei. 2000. "Pochemu v Rossii vozmozhen bezriskovyi ukhod ot nalogov?" *Voprosy ekonomiki* 11:134–152.

Zhuravskaya, Ekaterina V. 2000. "Incentives to Provide Local Public Goods: Fiscal Federalism, Russian Style." *Journal of Public Economics* 76:337–368.