

SIGNALLING AND COMMITMENT PROPERTIES OF PARTIAL
PRIVATIZATION

By

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Abstract

This thesis deals with the political economy of privatization. Chapters one and two review the empirical and formal literatures on privatization and argue that informational asymmetries with respect to the value of the enterprise prepared for sale, workers' opposition, and rent seeking are important obstacles to privatization plans.

Chapter three presents two simple formalizations of the idea that a government determined to privatize an enterprise may need to privatize only a part of that enterprise because of asymmetric information. Partial privatization signals the enterprise's worth to investors and is therefore a second best strategy available to a government, which seeks to maximize revenues from privatization and enhance enterprise efficiency. Hence partial privatization need not improve enterprise performance, rather better performing enterprises tend to be partially privatized.

On the other hand, privatization raises concerns about future job cuts and therefore workers often oppose privatization plans. Because of this resistance, governments tend to scale down, if not entirely abandon, initially quite ambitious privatization programs. Whenever privatization plans are not fully abandoned, governments could implement partial privatization, selling either a fraction of the enterprise or separate units belonging to it, in a bid to secure the workers' acquiescence. How can partial privatization work as a mechanism that commits the government to cater to workers' interests *ex post*?

Assuming that the average worker cares about employment more than about efficiency and profits, chapter four suggests the following mechanism: under certain conditions, partial privatization softens the budget constraint that the prospective enterprise owner would face, which will lead to the implementation of a larger number of investment projects, regardless of their efficiency, than otherwise and thereby increase employment above the optimal level. Such a commitment device on the part of the selling government is credible because it relies on the government's purely economic incentives, rather than just on its benevolence, paternalism or political ideology. Chapter four also speculates that the continuous nature of the government's involvement, namely the incremental provision of the soft budget, resolves the flipside of the commitment problem, *i.e.* ensures that workers would cast their votes for the government in question.

Finally, chapter five argues that governments may refuse to privatize enterprises that would be valuable to their future owners primarily in terms of the subsidies that can be extracted from the state. Changes in the market environment effected by privatization imply changes in the role and nature of rent (or subsidy) seeking activities. Chapter five makes use of some of the results in the literature on rent seeking contests to identify factors that affect the amount of resources devoted to such socially wasteful activities.

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'For any assessment of the results of privatization, look hard, and evidence for opposite conclusions can be found.'

Frydman, Murphy, and Rapaczynski (1989)

Chapter 1 – Theoretical Preliminaries and the Analytical Framework

1.1 Introduction

This thesis contributes to the analysis of privatization policies. It begins by presenting a summary of some of the key results derived in the empirical literature on privatization in transition economies and elsewhere in order to identify obstacles that tend to thwart successful privatization programs. It also identifies reform strategies that governments have pursued, or indeed could have pursued, in order to overcome these obstacles. The criteria for choosing the problems addressed have been somewhat narrow. Roughly, the selection criteria were to find issues that are suggested by empirical studies and posed a puzzle, but at the same time are policy relevant and analytically manageable.

Essentially, the thesis makes three related points. First, asymmetric information about the quality of enterprises slated for divestiture, and/or workers' opposition might

prevent successful privatization. Second, partial privatization might be deployed as a strategy to tackle both problems. Partial privatization can signal the enterprise's worth to potential investors. In this setting, the selling government decides to retain a stake enterprise that perform relatively better even if it would prefer to fully divest these enterprises. If this were really the case, then partially privatised enterprises should be expected to show better performance after privatization. Indeed empirical evidence indicates that this proposition is valid. Through a different mechanism, partial privatization could credibly commit the government to pursue policies that lead to employment levels higher than the optimal level because partial privatization softens the budget constraint of the new investor, thereby securing the workers' acquiescence ex ante. Two of the core chapters of the thesis, chapters three and four, propose formal models that detail the mechanisms behind these signalling and commitment scenarios.

Finally, the third core chapter, chapter five, is devoted to rent seeking. Socially wasteful rent seeking activities are said to constitute another serious obstacle to privatization. Chapter five is an attempt to make this argument more precise. It argues that a government that is interested in minimizing rent seeking, or rather the amount of resources devoted to rent seeking activities, might be unwilling to privatize enterprises that would prove valuable to their owners primarily in terms of the rents that can be extracted from the state budget, for example government-sanctioned subsidies. The bulk of chapter five is devoted to reviewing, and occasionally extending, some of the main insights of the literature on rent seeking contests in order to identify factors that are conducive to more pervasive rent seeking activities. The analysis in that chapter is more

abstract in comparison to the analyses in the preceding two chapters. Its argument is not motivated by specific empirical observations and is thus rather speculative in nature.

The present chapter outlines the theoretical framework of the thesis. Section 1.2 discusses issues related to methodological individualism, a framework used throughout the analyses that follow. The goal of this section is to set the limits of the argument as sharply as possible and thereby anticipate critical remarks regarding the theory of rational choice, rather than the arguments advanced in the thesis. Section 1.3 briefly presents a set of impediments to privatization that have been proposed in the literature, and contrasts this set with the three issues addressed in the core chapters. The goal pursued is to highlight how the present analysis fits into the existing literature on privatization policies and to reflect on whether and how it contributes to that literature. The following two sections deal with more general issue of reforms. Referring to recent analyses of the political economy of reforms, the goal of these sections is to reproduce the argument that the design of reform packages should take into account the role of various veto players that have both stakes in the status quo and enough leverage to block reform packages. Many reform packages constitute potential Pareto improvements, as seems to be, or at least was thought to be, the case with privatization, provided that certain groups receive ex-post or ex-ante compensations. Indeed, the pursuit of Pareto improvements is the primary motivation behind any reform package. However, informational and commitment problems often hinder the implementation of such Pareto improvements. The theory of transaction cost politics, which is invoked in this thesis, deals with these issues. Section 1.6 concludes the chapter.

1.2 Methodological Issues

The key goal of the analysis presented in the chapters that follow is to provide possible *explanations* of the phenomena under scrutiny by providing accounts of the *mechanisms* that could have generated these phenomena. Therefore, none of the claims in this thesis should be thought of as a general law (Elster 1992, p. 3). These mechanisms are most plausibly viewed as stories that might have happened and indeed would happen if and only if the assumptions that underlie them hold, a justification of formal models that economists from the University of Chicago are said to have proposed.¹

Of course, in most cases these assumptions tend to be so demanding that this is equivalent to saying that the stories in question have never taken place and will almost certainly not happen in the future. This assertion is certainly true for the models analyzed in this thesis. Even worse, the proposed mechanisms only partially accord with Elster's (1992) list of characteristics that true causal mechanisms should not exhibit.

In chapter one of his influential book, Elster submits that true causal mechanisms are different to: (i) *true causal statements*, i.e. causal mechanisms that might be empirically and logically correct, but are in fact irrelevant to the problem at hand because two or more mechanisms might have the same set of empirical components;² (ii) *true statements about correlations*, i.e. statements about empirically valid patterns of association that fail to explicitly identify a proper causal mechanism; (iii) *true statements*

¹ One possible definition of mechanisms, advanced by Elster (1998) is 'frequently occurring and easily recognizable causal pattern that is triggered under generally unknown conditions or with indeterminate consequences' (1998, p. 45). Thus, for example, in contrast to general laws, whereby a set of conditions always leads to a certain outcome(s), mechanisms might lead to indeterminate outcomes. Yet, mechanisms are useful because they allow for explaining outcomes, although not necessarily predicting them.

² Elster gives the example of a person who ate rotten food and died. If the person in question indeed died because the food was rotten, but, in addition to that, she was allergic to that particular food, then the statement that she died because of having eaten food she was allergic to is empirically valid but logically incorrect.

about necessitation, i.e. explication of mechanisms that would necessarily cause the observed phenomenon, but in actual fact did not take place and the outcome was caused by another, pre-empting, mechanism;³ (iv) *storytelling*, i.e. logically correct statements about mechanisms that could cause an outcome that did not in fact occur;⁴ (v) *predictions*, i.e. correct explanatory mechanisms do not necessarily possess predictive power because different outcomes might be brought about by more than one mechanisms that are in principle impossible to observe.⁵

The following paragraphs characterize the three mechanisms proposed in this thesis in terms of Elster's five points concerning causal mechanisms.

i. As already mentioned the propositions characterising the signalling and commitment properties of partial privatization are best viewed as *true causal statements* because they logically follow from explicitly stated assumptions. The claim that they are *causal mechanisms* can only be tentative at best. The discussion concerning the signalling model is accompanied by some relevant empirical evidence, i.e. the finding that partially privatized enterprises on average performed better than fully privatized enterprises even *prior to* privatization, which indeed suggests that governments might have partially

³ The difference between statements about necessitation and statements about true but irrelevant mechanisms is somewhat subtle. As far as I can tell from Elster's discussion, true assertions about necessitation are logically correct, but are empirically irrelevant, say, because another mechanism became effective in the last moment, pre-empting the alleged mechanism. Elster gives the example of a person who was certain to die within one year of cancer, but was killed in a car crash within that period of time. The statement that cancer was a necessary condition for her death within this one year is logically correct but in fact empirically wrong.

⁴ In Elster's account storytelling is equivalent to generating hypotheses about outcomes that should be observed, provided that the starting assumptions of the story are correct (p. 8).

⁵ Some people contribute to endeavors that are public goods, i.e. non-excludable and non-rival, because they expect other to do likewise. In contrast, some people do not contribute if they expect others to contribute because the endeavor is successful anyway, given its public good nature. In either case, a valid causal mechanism has been stated, hence our understanding has advanced, although the outcomes are different, hence impossible to predict.

privatized for signalling purposes. However, an obvious objection to this claim is that governments might retain stakes in some enterprises simply because these enterprises are profitable and it therefore makes perfect sense to retain a stake in a profitable venture. But then why privatize a profitable enterprise even partially? Most governments launch privatization programs for two reasons: (i) to enhance enterprise efficiency, which is allegedly hindered exactly because of the government's intervention, and (ii) to raise revenue. However, partial privatization fails to fully achieve either of these two objectives. To the extent that external investors are brought in to improve efficiency, the selling government would need to prove that it is not attempting to get rid of a problematic enterprise and that the investment is worth it. Furthermore, and even more speculatively, it need not be the case that governments consciously signal, i.e. partial privatization need not be explicitly mentioned in policy documents or statements as being adopted to facilitate signalling, for the argument to hold. Should the government fail to provide such a 'signal' however, no privatization would take place. Thus successful partial privatization occurs because the selling government unknowingly proves to prospective investors that the enterprise it wants to sell is a viable one. Yet, the point that a plethora of different mechanisms might stand behind partial privatization is a valid one.

The same disclaimer applies to the discussion of partial privatisation's commitment properties. Indeed, it is difficult to imagine that workers who object to privatizing a large stake of their enterprise tend to acquiesce to the privatization of a smaller stake because they are aware of the sophisticated game theoretic model of soft budget constraint proposed by Dewatripont and Maskin (1995) and invoked in chapter four of the present thesis, or even of the more straightforward original mechanism

described by Kornai's (1980) influential analysis. For example, workers' perception of having won, i.e. having succeeded in making the government reduce the share that is actually divested, might well be a reason for acquiescence.⁶ While the soft budget constraint argument equips workers with too much rationality and foresight, the idea that workers, or perhaps more plausibly their union leaders, short-sightedly accept a privatization deal that is only nominally watered-down is perhaps equally extreme. The truth could be somewhere in-between.

Finally, the issue of viewing ex-post rent seeking as an ex-ante obstacle to privatization clearly fits Elster's account of *storytelling*, and is at best a hypothesis generating exercise. The rent-seeking story is an attempt to deal with an issue raised in the theoretical literature on privatization policies – it does not seek to explain observed phenomena.

ii. Both the superior ex-ante and ex-post performance of partially privatized enterprises, and workers' initial opposition to privatization and subsequent acquiescence might be caused by mechanisms *different* to the ones described in this thesis. As in the previous point, a stake in a profitable firm need not resolve problems of asymmetric information, but simply suggest that the enterprise is profitable. The reasoning from that point again provides a counter-argument. It is also important to note that even if a stake is retained because the enterprise is profitable, this amounts to no less than a strategy of 'signalling' precisely the fact that the enterprise is a 'good' one. As for the commitment issue, workers and/or politicians might seek to scale down privatization plans not because this would soften the budget of the future (partial) owner and thereby increase

⁶ Julius Horvath suggested this argument.

employment, which is indeed somewhat too involved a reasoning, but because the enterprise in question is deemed important to the nation. This, however, begs the question: What does ‘importance’ exactly mean? Certain enterprises, most notably energy utilities, are indeed important. Yet, it is not entirely clear why the privatization of such enterprises would compromise national security. It could also be the case that people are often emotionally attached to enterprises that allegedly symbolize their national pride.⁷ However, it is difficult to square this statement with the assumption that people are, to a certain extent at least, rational and forward-looking. In any case, these problems are sidestepped by assuming that the workers in the commitment model of chapter four maximize employment. Chapter three describes case studies that are consistent with this assumption. Still, the idea of emotional attachment admittedly circumscribes the validity of the soft budget constraint argument.

iii. Elster’s perhaps most demanding requirement is to distinguish between causal mechanisms and *assertions about necessitation*. In other words, although the causal mechanism one advances could have indeed caused the phenomenon in question, that mechanism might have been *pre-empted* by another mechanism leading to the same outcome. All arguments in the chapters below are vulnerable to this sort of criticism because they are based on assumptions about beliefs and motivations, both of which are in principle unobservable. An infinite number of factors could change the behaviour and beliefs of policymakers at virtually any point of time. As Elster explains ‘To find out what actually happened, we need more finely grained knowledge. The quest never ends: right up to the last second’ (Elster 1992, p. 6) The arguments in this thesis are therefore

⁷ This point was raised by Zdeněk Kudrna.

valid only to the extent that the details included in the empirical accounts are finely grained.

iv. According to Elster, the advantage of *storytelling* is that it is supposed to strive for parsimony. The trade-off between parsimony and *genuine explanation* is of course present in any social science account that is presented on a finite number of pages. To repeat the Chicago school's justification of formal models, the accounts described in the coming chapters are parsimonious stories that might have happened, with the apparent advantage of making the underlying assumptions explicit. Certainly, the rent seeking model of chapter five is based on little more than armchair reasoning.

v. Although this thesis is an attempt to further our understanding of privatization policies, none of the arguments presented can be said to possess any forecasting power. As a counterfactual, however, it could be asserted that should partially privatized enterprise had been fully privatized their performance would have been even better because the decision making within fully privatized enterprises would have been more fully depoliticised.

1.3 Obstacles to Successful Privatization

Most of the empirical literature suggests that privatization has been an overall success in almost all countries around the world. Although more will be said about this observation in the empirical review in chapter two, it is worth mentioning here that except insiders, i.e. workers and managers, almost all owners, especially foreign large-stake owners, have

improved the economic performance of privatized enterprises. Therefore privatization can be characterised as a reform policy that passes the Kaldor-Hicks compensation test, i.e. losers could potentially compensate winners and still be better off with privatization than without privatization, if not the more stringent Pareto criterion, according to which there should be only winners and non-losers. It is important to note that most of the time policy advisers and policy makers expected exactly such an outcome. Perhaps the most conspicuous differences in privatization programs had to do with the methods of divestiture, e.g. voucher privatization, sales for cash or, whenever possible, floating the enterprise's shares on the stock market.

Oftentimes, however, privatization proved difficult. This section briefly outlines Gérard Roland's (2000) comprehensive discussion of the constraints that reformers launching privatization tend to encounter, and compares these constraints to the problems addressed in the following chapters.

Roland's account of the obstacles to privatization distinguishes among stock-flow constraints, fiscal constraints, political constraints, constraints related to rent-seeking, informational constraints and administrative constraints. He examines the effects of these constraints in light of privatization programs' key objectives – efficiency enhancing and successful restructuring.

The *stock-flow constraint* refers to the lack of accumulated wealth that could be used by economic actors to acquire stakes in enterprises. Obviously, this obstacle is more pertinent to countries transiting from command economies to capitalism, and less so to privatization programs in countries with developed stock markets and/or strong banking sectors. The most obvious reform tactics in this case is to attract foreign capital, launch a

program of mass privatization in which enterprise shares are distributed to citizens free of charge, or simply delay the program. The inflow of foreign capital strategy in the case of transition countries, however, faced problems stemming from the lack of adequate information concerning domestic political and economic risks. Mass privatization, on the other hand, possessed obvious distributive advantages, at least as initially designed, which made it politically appealing, but was not designed to bring revenues to governments that often had to deal with the burden of huge foreign debts or had to compensate reform losers in order to secure their support.

The *fiscal constraint* is closely related to the stock-flow constraint. It has to do with the expenses that governments incur because of privatization, which are mainly related to the restructuring process that privatization is expected to trigger. As restructuring is associated with job cuts, a politically viable reform package should include a compensation mechanism for laid off workers, or, alternatively, should commit resources for subsidies paid out to enterprises that employ more workers than needed because of political reasons. In addition, at the outset of reforms, transition countries lacked tax systems, which were needed to gather budget revenues from enterprises that would be transferred to private hands.

The *political constraints* are conceived more broadly and thus apply to any reform program, not just privatization. The literature Roland summarises distinguishes between *ex-ante* political constraints, which prevent the very decision of launching reforms, and *ex-post* political constraints, i.e. the possibility of reform reversals. As Fernandez and Rodrik (1991) show, this distinction is especially relevant for the design of successful reform strategies when the distribution of gains and losses is uncertain.

The argument advanced by Fernandez and Rodrik (1991) goes as follows.

Suppose each voter yields a benefit g from a reform with probability p and loses l with probability $(1-p)$. The status quo payoff is 0 for each voter.

With a large number of voters, for $p > \frac{1}{2}$ the reform package would be supported ex-ante and not reversed ex-post if and only if

$$(1.1) \quad pg - (1-p)l > 0$$

However, if the last inequality is reversed and voters are risk neutral, the reform would be rejected ex-ante, because voters know that it would not be reversed ex-post, that is when the uncertainty is resolved, despite the fact that a majority of voters would benefit ex-post. Furthermore, if $pg - (1-p)l > 0$ and $p < \frac{1}{2}$, the reform package would be reversed ex-post whenever the expected one-period benefit

$$(1.2) \quad (1-\delta)[pg - (1-p)l]$$

where δ is a discount factor, is smaller than any possible costs related to the reversal of reforms. Knowing that the reform would be reversed once the uncertainty disappears, voters would reject the package ex-ante, even if the expected payoff at the individual level is positive. Importantly, nowhere in the argument do we have to assume that voters are averse to risk.

Fernandez and Rodrik (1991) proceed by showing that in this setting, which is characterised by individual uncertainty, the simultaneous implementation of two complementary reforms, that is a big bang approach, is more likely to be successful than gradualism, i.e. the sequential implementation of reforms. Of course, this result holds

under the special assumptions Fernandez and Rodrik make. Dewatripont and Roland (1992) generate a model involving *aggregate* uncertainty, in which gradualism turns out to be superior to big bang. The model of Dewatripont and Roland is briefly summarized in section 1.4.

Closely related to the political constraints discussed above is the rampant *rent seeking* that privatization programs are said to provoke. Privatization can be viewed as a process of *rent creation*. In transition countries, in particular, essentially the bulk of the economic assets were up for grabs, which understandably led to socially wasteful influence efforts. In this context, Hellman's (1998) influential paper, showed how the early winners of partial reforms might seek to block full-scale implementation of reforms in order to preserve the sources of their rents. Hellman's argument can perhaps be viewed as an instance of *interim* political constraint. Rent seeking, or rather rent preservation might also take place ex-ante, for example by workers who oppose privatization because they expect job cuts. The government then should find ways to assuage these fears. Chapter three of this thesis is devoted to this issue.

More subtly, however, ex-post rent seeking might effectively 'crowd out' restructuring activities. As Frydman and Rapaczynski (1994, pp. 189-195) argue, while some enterprises have *economic* value, which is generated in the context of normal market interactions, other enterprises might have just *political* value, which is reproduced only through a process of politically motivated redistribution of resources, i.e. rent seeking. Although the ownership of the latter type of enterprise might be nominally transferred to private hands, these enterprises are valuable only because they allow their owners to exercise political pressure to obtain subsidies or other types of rent, even if the

enterprises in question continuously generate losses. Although rent seeking negatively affects the whole economy in general, and eventually the rent seeker in particular, in extreme circumstances it might effectively crowd out all productive activities if the marginal return to rent seeking falls at a slower rate than the marginal return to productive activities (Murphy, Shleifer, and Vishny 1993). The ‘benefits’ from rent seeking thus outweigh the benefits of productive activities in *relative terms*, as rent seeking feeds on itself by reducing the marginal costs of further rent seeking relative to production. The process is characterized by increasing returns to scale – more rent seeking makes further rent seeking more attractive (Murphy, Shleifer, and Vishny 1993, p. 409).

Such a phenomenon will be particularly pronounced when most enterprises slated for sale are economically worthless. Therefore although Frydman and Rapaczynski (1994) suggested that selling firms to a large number of investors would ameliorate the problem because losses at one enterprise would offset the gains at another, the economy might still get entrapped into a low-level inefficient equilibrium with widespread rent seeking. This outcome is the result of two related factors. Firstly, as implied in the previous paragraph, individual rent seekers grow stronger as the total number of rent seekers increases. Secondly, the best defense against rent seeking is rent seeking. Those who fail to lobby for rents, say, favorable legislature or subsidies, are at a disadvantage vis-à-vis those who lobby.

The *informational* constraints that Roland describes stem from the informational asymmetries related to the characteristics of potential investors. To the extent that the conditions of Coase’s theorem are not met, that is when high transaction costs prevent

enterprises from being transferred to better owners, the selection of initial owners is crucial for the future performance of enterprises. Again this sort of problem is exacerbated in transition countries due to the lack of developed stock markets, which might help overcome this informational hindrance. Chapter two briefly presents the model of Aghion and Blanchard (1992) that shows that once an enterprise is sold to insiders, i.e. workers and managers, who care about employment more than they care about profits, the latter might entrench themselves and effectively prevent the enterprise from being sold to outsiders, who would presumably enhance efficiency by replacing some of the workers.

Finally, privatization is a daunting task from *administrative* point of view. The state agencies handling privatization should not only deal with a series of legal issues concerning the delineation of ownership and its effective transfer, but also ensure that the actual reform implementers, the bureaucrats, have incentives that are appropriate for the task at hand. Even the most superficial discussion of the rampant corruption associated with privatization should be treated separately, although it would hardly yield insights that could surprise those following privatization programs, especially in transition countries.

How do the problems analyzed in this thesis relate to the constraints presented above?

The analysis abstracts from macro issues in order to concentrate on the micro logic of successful privatization. It does not consider the systemic change that privatization was supposed to bring about, an issue discussed, for example, by Kornai (1992). Circumscribing its scope even further, the thesis considers just two of the large

number of interactions that should be analysed in the design of privatization programs – the interaction between the selling government and potential investors, and the interaction between the selling government and the enterprise’s workers. It is important to note that these are not the most important interactions out of all possible – they were simply chosen because of the puzzles they posed. Still, in several of its aspects, the analysis that follows directly bears upon Roland’s taxonomy.

First, the informational impediments to privatization are the focus of chapter three. However, while Roland highlights the difficulties of matching enterprises with good owners, chapter three considers the problem of convincing these owners to get involved.⁸ Second, the commitment property of partial privatization in chapter four has to do with Roland’s ex-post political constraint problem. Specifically, the credibility of partial privatization in the setting of that chapter is what ensures that it is reversal-proof. Third, by including the revenues of privatization into the government’s payoff function in both the signalling and commitment models, the present account partially deals with Roland’s fiscal constraint.

Finally, the issue of rent seeking and its relation to privatization is the focus of chapter five. The analysis there relates to the general problem of understanding the obstacles to privatization, not to partial privatization in particular. Furthermore, chapter five does not attempt to describe how governments can deal with post-privatization rent

⁸ The model in chapter three assumes that the selling government has superior information about the enterprise’s worth, and therefore tries to signal whenever the enterprise is a ‘good’ one. Li and Wang (2005) study the obverse scenario. In their model the buyer is the manager of the enterprise who is better informed about the enterprise’s quality, or about her own managerial qualities. Partial privatization then could be viewed as a screening device, allowing the government to elicit information from the manager and obtain a better price. After presenting the signaling scenario, chapter 3 describes the model of Li and Wang to show that it yields results that are the exact opposite of the results of the signaling model. However, the signaling scenario seems to accord better with certain empirical results, compared to the screening model.

seeking, apart from making the obvious claim that in anticipation of such activities, the government might abandon the privatization program altogether. A more complete analysis of this problem would account for the fact that potential private owners would try to assuage the government's fears and would search for commitment devices that credibly restrain them from engaging in rent seeking.

1.4 The Credibility of Reforms

1.4.1 Naïve Stakeholders

This thesis seeks to deal with strategies for overcoming resistance to privatization in a *credible* way. One can easily encounter numerous instances of reforms that seek to mislead the status quo stakeholders into making 'concessions' that are afterwards forfeited. While such *stratagems*, might work once, they would hardly pass as viable policy recommendations because they rely on the stakeholders' short-sightedness.⁹ As an instance of such non-credible reforms, this section considers Shleifer and Treisman's (2000) insightful account of the 'successful' *cooptation* of stakeholders during Russia's infamous privatization program of the early 1990s.

According to Shleifer and Treisman (2000), in order to successfully push through an ambitious privatization program, allegedly the largest in history, Russian privatizers had to secure the acquiescence of Russia's (i) industrial ministries, (ii) regional and local governments, (iii) industrial directors, and (iv) workers. Co-opting the first three sets of

⁹ The word 'stratagem' seems appropriate in this context, as its Cambridge Advanced Learner's Dictionary meaning is 'a carefully planned way of achieving or dealing with something, *often involving a trick*' (emphasis added).

players did not prove difficult. The industrial ministries had lost much of the influence they used to wield in enterprises' decision making already in the late 1980s when the workers' collectives acquired the power to elect the heads of enterprises, who were previously appointed by the ministries. To ensure that industrial ministers do not obstruct the overall privatization plan at the political level by hindering government decision making, the reformers gave industrial ministries the power to effectively veto the privatization of a handful of enterprises that were deemed strategic, mainly enterprises in the raw materials, energy, transport and defence sectors, but not the power to prevent privatization of enterprises in other sectors. Similarly, regional governments were allowed to take over small-scale privatizations.

Industrial directors and especially workers, however, posed a potentially more serious threat to reforms. In the late 1980s, industrial directors acquired substantial managerial powers concerning relations with customers, production organization and even partial price setting. In addition, industrial directors were the ones who knew the enterprises' inner workings, which essentially placed them in a position to halt any reform initiated by the central government. Workers, on the other hand, simply had the right to launch strikes over collective labor agreements and could thereby block production physically, should reformers failed to assuage their fears.

Because of their influence, both directors and workers had to receive substantial concessions in the early stages of privatization. Following lengthy parliamentary debates, workers and managers were allowed to choose between two privatization options: (i) acquire 25% of their enterprises' capital in the form of non-voting shares free of charge and (ii) acquire 51% of their corporatized enterprises' shares at very low prices. In

addition, staff at smaller enterprises were allowed to acquire 20% of their enterprise at the shares' accounting value. Shleifer and Treisman, however, point out that the third option was too complicated, which made it practically unavailable in most cases. Therefore, over 80% of the firms privatized in 1992 adopted the second option.

Although as the authors argue it was the best available option given the circumstances in Russia, this reform stratagem had two negative consequences regarding directors and workers. First, it led to widespread privatization to insiders, i.e. workers and managers, which turned out to have a negative impact on the post-privatization performance of enterprises. Second, and more important for the present analysis, because Russia essentially lacked mechanisms of corporate governance, the stakes of small shareholders and workers were very often forcefully expropriated in the post-privatization period.

The account of Black, Kraakman and Tarassova (2000), for example, paints a particularly gloomy picture of Russia's privatization and its consequences. These authors, who were themselves involved in advising on the country's transitions path, argue that Russia's privatization to a large extent fell prey to *kleptocrats* and instead of contributing to the establishment of a market economy, created Russia's infamous class of powerful oligarchs. From the point of view of the present argument, especially interesting were the expropriation strategies adopted during and after privatization.¹⁰ In a nutshell, due to the lack of mechanisms of corporate governance, the rapid pace of sales of enterprises,

¹⁰ Black, Kraakman and Tarassova (2000) describe a wider range of corrupt or outright criminal strategies for quick enrichment pursued by Russian kleptocrats. Many of these practices, such as the notorious loans-for-shares program or the widespread tax evasion, did not involve identifiable losers due to their concentrated-gains-dispersed-losses nature. Of course, Russian citizens were the obvious losers, but collective action problems have prevented them from wielding any noticeable influence. In contrast, expropriation, non-payment of salaries or bankruptcies resulting from asset stripping did involve identifiable losers and therefore better fit an account dealing with stakeholders.

rampant corruption, captured state, and the passive populace, many of the most valuable Russian enterprises ended up into the hands of insiders, i.e. managers. Through *self-dealing*, these insiders managed to expropriate the stakes of smaller shareholders, most often workers.

“... enterprise managers acted in dubious ways to acquire more shares and thereby cement their control. Managers had the easiest access to employees’ shares, and often bought them at very low prices, sometimes by threatening retribution if the employees did not sell. Sometimes shares were bought with company funds, but the managers ended up with the shares. Other times, managers siphoned funds from the company through self-dealing, which they used both to buy employee shares and to improve their own standard of living.”

(p. 1767)

More straightforward expropriation stratagems involved the non-paying of salaries to workers and/or the deliberate pushing of enterprises into bankruptcy.

“Not infrequently, manager self-dealing compromised firms’ viability. Russia’s coal industry offers an example. Many coal-mining firms were doomed to fail. But even potentially profitable firms were sometimes bankrupted by crooked managers. Common skimming techniques include: selling the coal to an intermediary at below market prices; buying mining equipment at inflated prices; and paying workers with vouchers redeemable at the company store, which sells goods to this captive market at above market prices; with the managers in each case pocketing the difference. Coal workers and their unions, instead of asking where the cash went, periodically go on strike against the

Government for unpaid back wages, sometimes shutting down railways to dramatize their claims.”
(p. 1767)

Obviously, such expropriation stratagems can be successful only once. As Black, Kraakman and Tarassova argue, they discredited the privatization program and even generated new Russian words such as ‘prikhvatizatsya’ (from prikhatit – grab and privatizatsya – privatization), which can be translated as grab-privatization (p. 1747). In this sense, Russia’s privatization was not a credible reform, at least with respect to workers and minority shareholders because it relied on the economic and legal naiveté of workers, and would therefore not succeed, were the Russian government to try it again.

1.4.2 Rational Stakeholders and Time Inconsistent Behavior

The issue of credibility transpires even when actors are assumed to be rational and forward-looking. In such cases, governments might not be able to commit themselves to carrying reforms through because of temporal inconsistencies. To clarify this issue and to show how it relates to the commitment problem analyzed in chapter four, this subsection presents a stripped down version of a model of reforms studied by Dewatripont and Roland (1990).

The authors consider a sector or an enterprise, which is characterized by low, inefficient level of productivity $e = 1$. The government may introduce a restructuring program, say privatization, and thereby improve the enterprise’s performance, bringing it to $e = 2$. There are three groups of workers, each group of size one, employed in the

enterprise and characterised by their disutility levels of effort, which are taken to be simply 1, 2 and 3. The government is unable to distinguish between the three types of workers and pays a uniform wage w , which together with productivity level e , determines the payoff of each type of worker as follows

$$(1.3) \quad \{(w - e); (w - 2e); (w - 3e)\}$$

In other words, forcing workers to be more productive reduces their payoffs, and this reduction is larger the less efficient the worker. The market value of the output $q(e)$ is the same for each group of workers and is higher if the firm works under the more efficient regime, i.e. $q(2) > q(1)$. In the status quo, i.e. without restructuring, the government's payoff is the sum of the total market output, the workers disutility and the difference between the wage bill and the market value of the output. The difference between the wage and the output's market value should be covered by subsidies, which are assumed to cause a distortion denoted by s . That is, the government's status quo payoff is

$$(1.4) \quad 3q(1) - 6 - s(3w - 6)$$

Assume that the parameters are such that the government would want to leave only the most efficient workers in the enterprise, and switch to a regime of higher productivity, $e = 2$. Workers can sabotage the program by staging protests, thus the government must grant an exit bonus to the entire pool of less efficient workers in order to secure their acquiescence. This can be achieved by granting an exit bonus $w - 2$, which ensures that workers of type 3 and 2 leave the enterprise, and a wage level $w + 1$, which compensates the most efficient worker for the extra effort they have to exert. Workers of

types 1 and 2 are therefore willing to accept the reform, in fact they are indifferent, while workers of type 3 receive a strictly positive payoff of $3 - 2 = 1$.

The government's payoff from this reform package is

$$(1.5) \quad q(2) - 2 - s[3w - 5 - q(2)].$$

Under certain conditions, however, the government can do better by keeping productivity low and giving an exit incentive only to the most inefficient group of workers, group 3, that is by introducing what could be called a *partial* reform. The wage in the enterprise would thus remain w and the exit bonus is $w - 3$. None of the workers receive a strictly positive payoff and the government's payoff is

$$(1.6) \quad 2q(1) - 3 - s[3w - 3 - 2q(1)],$$

which is more than the full reform payoff whenever

$$(1.7) \quad 2 < 2 - \frac{(1+s)[q(2) - 2q(1) + 1]}{2s}.$$

However, assuming that this last expression holds and therefore partial reform is desirable, Dewatripont and Roland show that such a partial reform package is not time consistent when extended over two periods. Specifically, after the workers from group 3 take their bonus $2(w - 3)$ for the two periods, the government has an incentive to induce group 2 to leave in period two, by offering an exit bonus of $w - 2$ and wage $w + 1$, and by raising productivity to $e = 2$. This indeed leaves groups 1 and 3 indifferent and improves the government's payoff by

$$(1.8) \quad (1+s)\{[q(2) - q(1) - 1] + 2 - q(1)\}.$$

But then, because workers in group 3 are forward looking, they would not leave in the first period whenever $w - 2 > 2(w - 3)$ or, equivalently, $w > 4$. In other words, the government's inability to commit itself to implement the original reform plan affects the workers' incentives so that their behavior makes the reform plan impossible to implement in the first place.

Finally, Dewatripont and Roland show that what they call a *gradual* reform package is time consistent in increases the government's payoff to a level higher than the full reform payoff, but lower than the partial reform payoff. This reform package looks as follows: The first period's productivity is kept at $e = 1$, the wage is w and the exit bonus is $(w - 3) + (w - 2)$, which induces group 3 to exit, while the second period's productivity is increased to $e = 2$, the wage is set at $w + 2$ and the exit bonus is $w - 2$, which induces group 2 to exit. The government's payoff from gradualism is shown to be exactly the average of the full and partial reform payoffs.

The point of this analysis is that issues of asymmetric information and credibility might lead to inefficiencies, in the Pareto sense. In the context of reforms, this means that because certain status quo stakeholders must be left indifferent between the status quo and the reform, the government is forced to implement its reform only *partially* or indeed *gradually*. Groups capable of blocking reforms need to receive *replacement* stakes regardless of whether they are naïve, as in the argument of Shleifer and Treisman or are rational and forward looking as in the theoretical construct of Dewatripont and Roland. The analytical framework of transaction cost politics addresses these very issues.

1.5 The Analytical Framework

The arguments presented in the chapters that follow borrow analytical insights from the theory of transaction costs that was initiated in economics by Coase (1937, 1960) and further advanced most notably by Williamson (1985) and North (1990). The framework was recently extended in an attempt to understand political processes in transaction cost terms by North (1990) and Dixit (1996), an extension that became known simply as transaction cost politics. Spiller, Stein and Tommasi (2003) provides a more applied view on the same issues. This section briefly discuss and compare the perspectives of North, Dixit and Spiller et al in order to clarify how the models developed in this thesis fit into them.

In one of the numerous programmatic papers outlining his ideas on institutions and institutional change, North proposes that politics can be usefully analyzed in transaction costs terms

A transaction cost theory of politics is built on the assumptions of costly information, of subjective models on the part of the actors to explain their environment, and of imperfect enforcement of agreements. Choices employing such models result in high political transaction costs and make political markets very imperfect. I believe that modifying the standard rational choice model by incorporating into it transaction cost theory can substantially increase the explanatory power of the model and make more sense out of the political markets we observe.

North (1990, p.355)

The emphasis thus is on actors' limited abilities to gather and process information about the world. This implies that actors make choices without having accurate

perceptions, which in turn affects the reality they live in. North lists a series of examples, in which economic actors have insufficient knowledge of, or plainly misunderstand, key aspects of issues that affect their interests in important ways. Actors' incorrect theories about the world directly bear upon the two types of transaction costs that North considers – the costs of measuring the values of goods and services and agents' performance and the costs related to agreement enforcement. North emphasizes that actors' subjective perceptions concerning politics are much more biased than their perceptions about economic transactions, because the terms of political deals are vaguer, the issues dealt with in politics are inherently more complex and because there is essentially no third party enforcement since the government, i.e. the ultimate enforcer, is one of the players with substantial stakes in the game.

North makes also clear that the political transaction costs tend to be higher than the transaction costs in the purely economic realm because the problems tackled in the political arena are not a random sample of the entire pool of existing problems. Indeed, politics deals mostly with public goods and the related free rider problems that markets fail to resolve. These are exactly the types of issues that are particularly beset by transaction costs. In addition, it is only issues affecting a large number of players that reach the political agenda because small groups are more likely to tackle their collective action problems on their own (Olson 1965), which further exacerbates the prospects of efficient political markets.

Finally, North indicates that transaction costs might stem from sources other than failures of instrumental rationality.

That is, if the actors had *true* models there would still be transaction costs, but they would be very different and much lower than were the subjective model imperfect.

North (1990, p.364, emphasis in the original text)

These other sources of costs of transacting are related to the interactive nature of decision-making. More specifically, they stem from informational and commitment problems, and persist even when actors are assumed to be fully rational.

Dixit (1996) elaborates on the informational and commitment failures of political decision-making more fully than North and makes clearer how transaction cost ideas can be used in applied theoretical work on politics. Dixit's framework is less ambitious than North's, but at the same time many themes ranging from studies emphasising the independence of central banks (Dixit 1996, p. 63) to policy proposals concerning commitment mechanisms in international trade (chapter three) relate better to the former. Specifically, according to Dixit, transactions costs in politics stem primarily from: pre-contractual advantages, non-observability of actions and non-verifiability of information, i.e. *informational problems*, which results in signalling, screening and auditing costs; *opportunism* (essentially rooted in problems of non-observability and non-verifiability); and *asset specificity*, which occurs when beneficial transactions fail to take place because one of the parties must make an investment which has no or lower value outside the transaction in question thereby reduces the party's ex-post bargaining power. Like North, Dixit recognizes that players would do something to overcome these problems and lists three types of commitment device addressed in the literature.

Schelling's *locking-in actions* aim at changing the physical and informational circumstances of a player in such a way that her ex-ante and ex-post optimal actions are

the same. As is by now well understood, this often implies restricting one's future set of available actions. (Dixit claims that this might force one to '*alter* one's preferences demonstrably' (page 65, emphasis added). This is somewhat inconsistent with the standard rational choice paradigm he adheres to, in which agents are assumed to have stable although, as it often happens, time-inconsistent preferences.)

Delegation is closely related to the locking-in action, as it also has to do with restricting one's future opportunity set. However, delegation involves a third party, an agent, who has a restricted mandate to carry out a certain action and is given appropriate incentives. Schelling's (1960) classic book analyses how informational and physical institutional aspects might feature in the commitment strategies available to rational players.

Finally, repetitive play might help players gain *reputation* of not yielding to ex-post opportunism, in anticipation of the future rewards inherent in an ongoing interaction. Like North, Dixit recognizes that the fundamental features of political markets lead to larger transaction costs. "Ultimately, the answer to the question: "Who guards the guardians?" must be: "No One." (Dixit 1996, p. 49)

Spiller, Stein and Tommasi (2003) build upon both North and Dixit. However, their emphasis is much more policy oriented. Their work is in fact designed as a policy research, agenda-setting paper prepared for a project launched by the Inter-American Development Bank's Latin American Research Network. Spiller, Stein and Tommasi's 'unifying theme is that *public policies are the outcome of intertemporal political transactions*' (p. 14, emphasis in the original). They explain how the transaction costs related to commitment problems, sunk costs and third party enforcement mechanisms

present themselves in the realm of politics, but only implicitly deal with informational asymmetries. Furthermore, the authors claim that their framework is different to the approaches proposed by North and Dixit in that it focuses on interactions among politicians, while North and Dixit are mostly concerned with transactions involving politicians and citizens. Methodologically, the framework of Spiller, Stein and Tommasi is meant to explain policy outcomes by looking for causal mechanisms that generate them, what they refer to as *backward-looking hypotheses* (2003, p. 11). It does not attempt to determine the impact a set of explanatory variable might have, what they term the *forward-looking hypotheses*. The authors claim that their approach is suitable for explaining a broad swathe of policy reform episodes and indeed provide a convenient set of questions, related to the nature and the number of players, as well as to exogenous institutional features, such as the character of the judiciary, that researchers should seek to answer in order to gain insight into the causes behind successful or failed reforms.

For the purposes of this thesis, the questions raised by the notion of bounded rationality emphasized so persuasively by North are set aside. Although the research on bounded rationality has developed rapidly recently, especially in relation to the results derived by experimental economics, it is still difficult to discern the emergence of a unified view on what would be the most appropriate bounded rationality framework for applied analytical work. In part, this is due to the fact that deviations from the standard rational choice model turn out to be very sensitive to the experimental environment within which the results are elicited, a point forcefully, and allegedly controversially, argued by Rubinstein (2003) for the case of hyperbolic discounting, for example.

The focus in this thesis is on transaction costs associated with the interactive nature of decision-making, emphasized by Dixit. Within this analytical frame, the analysis in the next chapters is substantially less ambitious than that of Spiller, Stein and Tommasi, who focus on a diverse set of large-scale policies ranging from pension reforms to measures aimed at reining in inflation. These are essentially systemic reforms affecting virtually every citizen of a country. In contrast, the privatization scenarios considered here involve at most three aggregate players – the government, the investor and the workers at the enterprise slated for privatization. While contextual features such as the availability of independent and effective judiciary are clearly important, these are either assumed away or assumed to exhibit characteristics that would induce the behavior postulated by the models. Needless to say, these are all important limitations of the analysis.

1.6 Conclusion

The purpose of this chapter was to set the analytical stage for the arguments that follows. The chapter sought to circumscribe the scope of the analysis in terms of the methodological boundaries set by the classical versions of rational choice and game theory, and relate it to the existing literature on reforms, in general, and on the obstacles to privatization programs in particular. Methodologically, it is important to highlight the oft-cited point that the costs associated with the drastic simplifications necessitated by the theory of rational choice are largely offset by the benefits inherent in the explicit nature of the assumptions behind this type of analysis. On the substantive side, the chapter

explained that the thesis is embedded in the theory of transaction cost politics; therefore its arguments are perhaps best viewed as instances of the general themes discussed in this field.

Nevertheless, the scope of the research is much narrower than what the proponents of transaction cost analysis believe their theory could explain. Specifically, problems related to the systemic nature of privatization program are sidestepped. While such narrow a focus misses important context-specific aspects of privatization programs launched around the world, it is better suited to yield more general insights into privatization policy-making. For example, the evidence presented in the next chapter, which provides the empirical motivation behind this thesis, is drawn from privatization programs carried out in both developed capitalist economies and transition countries. In principle, the mechanisms presented in chapters three, four and five pertain to any privatization program, not just those in transition economies.

Finally, it is important to emphasize that the models that follow assume away the existence of a third party enforcement because the government, in its capacity of a seller of state-owned enterprises, is among the players involved. While the commitment model in chapter four takes this into account, the government in that model finds it worthwhile to afford soft budgets out of purely profit-seeking preferences, the signalling models presented in chapter three do not. The signaling models simply assume that the government cannot renegotiate a privatization contract. A more elaborate model should explain why is it prohibitively costly for the government to expropriate private profits, or should imbue the selling government with reputation-building concerns.

Chapter 2 - Empirical Evidence and Related Models of Privatization

2.1 Introduction

This chapter presents a selection of empirical results and a brief overview of related analytical models of privatization and its consequences that motivate the subsequent analysis. Section 2.2 summarizes the findings of two reviews of econometric works studying the effects privatization had on enterprise performance in transition countries and in developed western economies. Although the results are overall favorable, the privatization programs in Russia and other CIS countries stand out as exceptions. Indeed most observers agree that privatization in Russia was associated with excessive self dealing and asset stripping and contributed to the establishment of Russia's powerful group of oligarchs. Privatized Russian enterprises register poorer performance compared to privatized enterprises in other transition countries, with workers and other insiders (managers) being the worst owners. Section 2.3 presents the seminal model of Boycko, Shleifer and Vishny (1996), which shows that privatization could de-politicize decision making in the enterprise and thus reduce excess employment and improve its performance. The section also presents the models of Aghion and Blanchard (1998) and Debande and Friebel (1997), which propose that insiders, i.e. workers and managers, who come to own or control an enterprise can effectively prevent its transfer to more efficient outside owners. Section 2.4 briefly discusses the relation between the empirical findings and formal models and argues that the existing literature fails to account for the fact that

the performance indicators of partially privatized enterprises tend to be at least as good as the indicators of fully privatized enterprises. This is the puzzle that chapter three seeks to explain. Section 2.5 concludes.

2.2 Empirical Evidence on the effects of Privatization: A Selective Survey

Improving the efficiency of enterprises has been the chief motive behind all privatization programs that had been launched around the world (Vickers and Yarrow 1993). How and when privatization leads to efficiency, however, turns out to be not quite clear. An enterprise held by dispersed, or even not so dispersed, private shareholders is quite similar to a state-owned enterprise managed by government officials, because in the latter case the incentives of the government need not diverge less from those of the ultimate owners, the voters, compared to the divergence of the preferences of the CEOs of a private enterprise from the incentives of the enterprise's shareholders. In principle, the principal-agent problems plaguing the management process within a large private enterprise owned by thousands of small shareholders are qualitatively the same as the principal-agent problems distorting decision making within a state-owned enterprise. In the latter case, the voters are the 'shareholders' of the enterprise. In either case, monitoring the directors of the enterprise has the characteristics of a public good, i.e. none of the shareholders/voters has large enough a stake to make it worthwhile for her to gather and analyze information on the performance of the directors. For example, Stiglitz and Sappington (1997) recognize that both the public and private provision of goods and services necessitate the delegation of decision making and authority to agents whose

interests diverge from the interests of the principals. They argue however that government intervention is less riddled with transaction in the case of public provision compared to private provision. In the latter case, creditors and more generally agents representing private financial interests, but not the government, possess residual intervention rights. What Stiglitz and Sappington (1997) term the Fundamental Privatization Theorem provides a set of conditions under which the public provision of goods and services *is not* better than their private provision. Their analysis stops short of elaborating on the conditions under which public provision is better than private provision.

Furthermore, governments can use their regulatory powers to shape the behavior of a private enterprise in order to pursue political goals, say via subsidies in exchange for excess employment, which again need not be consistent with profit maximization. Shleifer and Vishny (1994) show that with complete corruption, i.e. when politicians and managers bargain in view of maximizing each other's payoffs, privatization is irrelevant. Politicians can bribe the managers and achieve an outcome, excess employment in the context of Shleifer and Vishny (1994), that is exactly the same that would prevail under state ownership – a proposition that follows from Coase's theorem.

In the case of transition economies, the mechanism behind the alleged efficiency improvement was even more elusive. Indeed, Perevalov, Gimadii and Dobrodei (2000) list five sets of arguments about whether or not privatization would be efficiency enhancing or not.

- i. *The social view.* State-owned enterprises are instruments in the hands of the government for fixing market failures, such as public goods, implement pricing strategies when monopoly power is present or pursue some desirable social goals. This inevitably worsens enterprises' performance since these goals differ from profit maximization. In the socialist economies, however, these social goals provided to the employees of the enterprise subsidized insurance, vacations at inaccessible resorts owned by the enterprise or other related benefits and therefore might serve as an extra incentive for improved performance.

- ii. *Political view.* Private enterprises are less likely to be subject to political interference, which is conducive to excessive employment, dearth of investment and poor choices of product lines, location etc. State-owned enterprises are furthermore often pressurized by interest groups, while private enterprises are profit oriented. However, in the absence of proper institutions private owners are more interested in asset stripping than in taking long-term profit maximizing view. In such circumstances, political interference may even improve enterprise performance.

- iii. *Incentive view.* Managers in state-owned enterprises lack high-powered incentives and are improperly monitored. Bureaucrats are more inflexible in their supervision and care only about the regulations. Rent seeking is rampant. Private enterprises offer better incentives and salaries to the managers. However, as a major stockholder, the government can better monitor the managers, while due to free-riding holders of shares in a diffusely owned enterprise often fail to do so. More importantly, during ownership

changes managers may remain totally uncontrolled. Getting assets cheaply, new owners may simply prefer to enrich themselves quickly.

iv. *Human capital view.* Managers of state-owned enterprises are selected according to their ability to deal with politicians, while in private owned enterprises managers should be able to run the enterprise efficiently. Again, the private new owners may not be interested in the performance of their enterprise, but in quick enrichment (e.g. by asset stripping).

v. *Competition view.* Competition fosters enterprise efficiency. Commercial financial markets discipline private enterprises, while state-owned enterprises operate under soft budgets. However, there is no straightforward relationship between privatization and competition. Private enterprises can also have a soft budget constraint. In fact, the empirical results suggest that there exist an interesting non-monotonic relationship between competition and enterprise performance.

Numerous empirical studies, however, almost unanimously conclude that private enterprises perform better than analogous state-owned enterprises (Boycko, Shleifer and Vishny 1996) and that privatization does lead to significant increases in efficiency. Hence privatization passes the Kaldor-Hicks compensation test, i.e. winners could in principle compensate the losers and still be better off.

The remaining part of this section describes the key results from two articles surveying quite comprehensively the descriptive studies on privatisation by the time of

their publication. These are the survey papers of Megginson and Netter (2001), and Djankov and Murrell (2002).

Megginson and Netter start their survey by identifying ten papers comparing the relative performance of private and state-owned enterprises. Eight of these investigations register significantly better performance of private enterprises relative to comparable state-run enterprises. Two papers stand out as exceptions. Kole and Mulherin (1997) compare seventeen enterprises that were partially acquired by the US government from the 'enemy' during Second World War with privately owned enterprises and do not find that state ownership differs significantly from private ownership. Secondly, Pinto, Belka, Krajewski and Shleifer (1993) studied the reaction of Polish state-owned enterprises to Poland's reform measures of the early 1990s, including price liberalization and fiscal discipline, but, importantly, not privatization. They found that fiscal discipline and price liberalization led to improvement of the enterprises, even without actual privatization and attributed this to the hardening of the enterprises' budget constraints.

Secondly, Megginson and Netter summarize the results of thirteen case studies and industry and country specific comparisons of pre- and post-privatization performance of enterprises in non-transition countries. Eight of the papers report unambiguous performance improvement after privatization. Most dramatically, Ramamurti (1997) reports a 370% labor productivity improvement at Ferrocarrilla Argentinos, Argentina's railway network, along with improved services and substantially reduced dependence on state subsidies after the network's privatization in 1990. Five of the papers in this section yield mixed or ambiguous results. For example, Martin and Parker (1995) studied the effects of the 1981-1988 privatisation of eleven British enterprises on the yearly increase

of their value-added per employee-hour and on their rate-of-return on capital. More than 50% of the enterprises in the sample of Martin and Parker did not exhibit improvement immediately after privatization, while several enterprises improved their performance after the privatization plan was announced but before the actual divestiture. Similarly, Wallsten (2001) studies the effects of competition, regulation and privatization in the telecommunications sectors of thirty Latin American and African countries in the period between 1984 and 1997 and finds that privatization in itself does not improve performance, but should be accompanied by proper regulation and increased competition.

Thirdly, Megginson and Netter describe nine papers that compare the pre- and post-privatization performance of enterprises divested through the stock market in non-transition countries. All nine papers report positive effects of privatization. For example, Boardman, Laurin and Vining (2000) measure the pre- and post privatization operating and financial indicators of nine enterprises that Canada privatized between 1988 and 1995, and find a two-fold increase in profitability upon privatization, among other positive effects.

Finally, Megginson and Netter look at transition countries. They divide the empirical studies selected for this region into papers dealing with Central and Eastern Europe and the former Soviet Union. From the thirteen papers on Central and Eastern Europe, twelve report positive effects of privatization. Most notably, the sample of Frydman, Gray Hessel and Rapaczynski (2000) suggests that enterprises sold to outside investors increase their revenues by almost ten percentage points. In addition, state-owned enterprises were significantly negatively affected by the soft budget constraint expectation induced by the state. In a related paper, Frydman, Hessel and Rapaczynski

(2000) find that privatization to outsiders is associated with more beneficial risk-taking, which in turn improved product-restructuring. Interestingly, these authors discard the idea that human capital has a significant role to play in restructuring. The only paper that reports negative results is Harper (2002). The paper specifically looks at the mass privatization program that was launched in the Czech Republic during the 1992-1994 period, and reports that the program's first wave led to substantial declines in efficiency, sales and profitability. However, the Czech Republic's second mass privatization wave significantly improved both profitability and efficiency.

The papers dealing with Russia and the other countries from the former Soviet Union reviewed by Megginson and Netter present a more disparate picture. Only three from the six papers Megginson and Netter summarize report unambiguously positive affect of privatization. For example, Djankov (1999) looks at how the structure of ownership affects the performance of 960 companies in Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia and the Ukraine in the period between 1995-1997. The paper finds that foreign owners with large stakes lead to more restructuring. Managers owning small or large stakes, but not stakes of intermediate size, also restructure more intensively. Employee ownership significantly improves restructuring only in the low range of stake sizes, but is otherwise insignificant.

The most conspicuous from among the papers reporting negative or mixed results in the former Soviet Union is Black, Kraakman and Tarassova (2000). Relying on several case studies, this paper argues that Russia's privatization program led to 'self-dealing', which enriched a handful of people and thus resulted in 'kleptocracy'. The paper

concludes that Russia's mass privatization was a major failure as it led to pervasive rent seeking and distorted managerial incentives.

Concerning transition countries in particular, Djankov and Murrell (2002) survey more than 150 empirical investigations of the possible explanatory factors of enterprise performance in transition. The goal in the remainder of this section is to give a summary of the basic stylized facts about enterprise performance. The results of Djankov and Murrell are complemented with the findings of a selected set of studies with a strong emphasis on Russia, which seems to be the most researched case.

One potential problem related to the articles dealing with transition countries is that different researchers use different methodological approaches to study the issue. In particular, the employed measures of performance vary substantially. Bornstein (2000) identifies four classes of performance indicators used in econometric work. These are costs (proxied by number of workers or labor and material costs over sales ratio), revenues (measured by sales), productivity (sales per employee, value added per employee, value added per worker hour, total factor productivity), and profitability (measured by profits over sales ratio, profits over shareholders' equity, or by profits over total assets).

A useful theoretical taxonomy of restructuring activities has been offered by Grosfeld and Roland (1997, cited in Roland 2000, page 234) and employed extensively in empirical work. They distinguish between *defensive restructuring* and *strategic restructuring*. Defensive restructuring refers to measures aimed at reducing costs, scaling down unprofitable enterprise activity, shedding labor, getting rid of nonproductive assets

and other related measures. The aim of such defensive activities is to guarantee the immediate survival of the enterprise.

Strategic restructuring, on the other hand, refers to innovation and investment on a larger scale. It is based on a comprehensive business strategy and implies profound redeployment of assets, introduction of new product lines, new technologies etc. It also requires large financial resources.

In addition to the variety of measures, synthesizing the various econometric results is further hindered by the fact that they come from different countries and different time periods.

With these caveats in mind, Djankov and Murrell (2002) report the findings of what they call meta-analysis. This is a synthesis of the results of over 150 papers studying post-privatization performance, which relies on various statistical techniques in order to strengthen the significance of results by using a number of not so significant statistical estimates. The data in the surveyed studies comes from medium-large and large enterprises. In addition to evaluating the performance of state-owned versus privatized enterprises, Djankov and Murrell explore the effects of different types of owners, the role product market competition, soft budgets, and the role of managers.

A summary of their findings goes as follows.

1. Privatization is strongly associated with more enterprise restructuring. The privatization effect is, however, statistically insignificant in the Commonwealth of Independent States (CIS).
2. Privatization to outsiders is associated with 50% more restructuring than privatization to insiders (managers and workers). Investment funds, foreigners, and other

blockholders produce more than 10 times as much restructuring as diffuse individual ownership.

3. State ownership within traditional state enterprises is less effective than all other ownership types, except for worker owners who have negative effect. However, state ownership within partially privatized enterprises is surprisingly effective, producing more restructuring than enterprise insiders and non-blockholder outsiders.

4. Product market competition has a significant effect on improving enterprise performance. Enterprises in highly competitive sectors are 20-30% more productive than monopolies. In Eastern Europe, the effect comes mainly from import competition. Import competition, however has negative impact in the CIS, while domestic competition has no effect. Hard budgets have a positive effect, which is larger in the CIS (it is the second most important determinant in these countries) than in Eastern Europe.

5. The effects of different owners vary among countries. Workers are better owners in Eastern Europe than in the CIS. Banks and concentrated individual ownership are significantly better in the CIS than elsewhere.

The major divide across countries, however, seems to be between the countries of Central and Eastern Europe and the Commonwealth of Independent States (i.e. the former Soviet Union Republics except for the Baltic states). Not surprisingly the results of privatization in the CIS are rather disappointing. For example, Angelucci, Bevan, Estrin, Fannema, Kuznetsov, Mangiarotti and Schaffer (2002) report the results of a large enterprise-level random sample conducted in Russia during the mid-1990s. They evaluate

the effects on enterprise restructuring and performance of three major factors – enterprise ownership, competition and financial constraints.

A summary of their conclusions goes as follows.

1. Restructuring in Russian enterprises was modest, even ten years after the start of the economic reforms. Productivity has continued to fall and remains low, while investment levels were low and restructuring efforts insignificant.
2. Importantly, the bulk of enterprises are engaged in deep rather than purely defensive restructuring.
3. There is no strong evidence that outside ownership leads to better performance or higher levels of restructuring activities than insider ownership. However, there is positive association between restructuring activities and the competitiveness of the market in which enterprises operate. Domestic competition leads to more deep (strategic) restructuring. Foreign competition is still a relatively insignificant factor in enhancing enterprise performance, but it stimulates investment.
4. Financial constraints are highly correlated with corporate performance and behavior. Domestic monopoly power, financial constraints and to a limited extent state ownership lead to inferior enterprise performance.
5. There are clear interactions between state ownership and market structure. State ownership leads to improved performance when there is moderate domestic competition or import competition. It worsens performance when there is domestic monopoly power. Hence market structure matters when ownership is taken into account.

The impact of competition is very interesting in other cases too. For example, the study of Carlin, Fries, Schaffer and Seabright (2001) is based on a survey of 3,300 firms in twenty-five transition countries. Their key finding is that competition has significant non-monotonic effect on firm performance (measured by sales and labor productivity). In particular, enterprises that report between one and three competitors have somewhat better performance than those reporting more than three competitors, and much better performance than monopolies.

Finally, financial constraints were shown to play a prominent role in restructuring in other countries. For example, Coricelli and Djankov (2001) study the effect of soft budget constraints in Romania and find that although hard budgets are conducive to defensive (or passive) restructuring, access to external finance is crucial for engaging in strategic (deep) restructuring.

What could be the mechanisms behind the overall positive effects of privatization on enterprise performance, but also the more subtle effect of different forms of ownership? Boycko, Shleifer and Vishny (1996) present a formalization that provides an answer. The next section presents their model along with two related models that show how insiders can entrench themselves and prevent the transfer of the enterprise to more efficient owners. Boycko, Shleifer and Vishny (1996) is one of the most influential models studying the effects of privatization, as it captures the elusive idea that private enterprises are less subject to political interference, and that is why they perform better relative to state-owned enterprises. The model is presented in somewhat greater detail because its key assumption, that politicians attach different values to different allocations

of funds from the state budget, is employed in the arguments modeled in chapters three and four.

2.3 Three Models of Privatization

2.3.1 The Boycko-Shleifer-Vishny Model of the Positive Effect of Privatization

Suppose an enterprise is to choose between a low wage bill w , which is efficient, and a high wage bill W , which implies excessive employment and is therefore inefficient, i.e. $W > w$. The shareholders of the enterprise (represented by the managers) can claim a fraction α of the firm's profit, while the treasury claims the remaining part, $1 - \alpha$. There is also a ruling politician who cares about high employment, but also about the treasury's revenues. Following Grossman and Hart (1986), Boycko Shleifer and Vishny (1996) distinguish between cash flow rights, represented by the respective shares defined above, and control rights, i.e. decision-making rights over employment. Privatization is modeled as the transfer of decision-making powers, in this case the decision about employment, to the manager. Even if such a transfer takes place, however, the model assumes that the politician could influence decision-making within the enterprise by arranging subsidies in exchange for excessive employment. Denote the money spent of subsidies by v .

The politician attaches a value of η to each monetary unit allocated for wages and a value of ζ to each monetary unit that remains in the treasury. The model's key assumption is that the politician does not 'possess' the monetary units in question, but is

interested solely in the outcome that money can effect, hence the parameters η and ξ would in general be different. Finally, the politician a marginal cost measured θ to a monetary unit spent the subsidy v . Again the parameters v and ξ are assumed to be different. Monies taken from the treasury are ‘easy’ to detect, say because there is a plethora of competing claims on the state budget and politicians defending the interests different groups has a strong incentive to track budget expenditures. On the other hand, profits that an enterprise has failed to realize because of excessive employment are less easy to spot. All three parameters are positive but less than 1.

The politician’s payoff is given by

$$(2.1) \quad P(w, v) = \eta w - \xi(1 - \alpha)w - \theta v + (1 - \alpha)\theta v = \eta w - \xi(1 - \alpha)w - \theta v \alpha$$

in the case of efficient wage bill, and by

$$(2.2) \quad P(W, v) = \eta W - \xi(1 - \alpha)W - \theta v + (1 - \alpha)\theta v = \eta W - \xi(1 - \alpha)W - \theta v \alpha$$

in the case of inefficient wage bill.

Now if η is larger than $\xi(1 - \alpha)$, the politician clearly prefers the inefficiently high wage bill, W .

The payoff to the firm’s manager is the difference between the subsidy, adjusted for the enterprise’s profit share and the wage bill, again adjusted for the enterprise’s profit share. Symbolically, it is given by

$$(2.3) \quad M(w, v) = \alpha v - \alpha w,$$

if the wage bill is efficient, and by

$$(2.4) \quad M(W, v) = \alpha v - \alpha W,$$

if the wage bill is inefficient.

The manager would *ceteris paribus* prefer the low employment bill, w , to the higher wage bill, W . The politician, on the other hand may use subsidies to achieve high employment after privatization. Therefore there will be bargaining between the politician and the manager over v . The Nash bargaining solution with equal bargaining powers given the objective functions above, and a wage bill of w and no subsidy as an outcome in the case of bargaining disagreement, is given by v that maximizes the following expression

$$(2.5) \quad [M(W, v) - M(w, 0)] * [P(W, v) - P(w, 0)].$$

The solution to (2.5) is

$$(2.6) \quad v = (W - w) \frac{\eta + \theta\alpha - (1 - \alpha)\xi}{2\alpha\theta}.$$

Given this subsidy neither the politician nor the manager will be willing to switch from w to W , if and only if

$$(2.7) \quad \eta < \alpha\theta + (1 - \alpha)\xi,$$

which is the condition under which restructuring will take place.

The effect of privatization in the model is represented by the difference between $\eta < \alpha\theta + (1 - \alpha)\xi$ and $\eta < (1 - \alpha)\xi$, which is the condition implying that the politician prefers the efficient wage bill w . Hence Privatization improves efficiency via two channels. Firstly, the term $\alpha\theta$ captures the intuition that the politician faces an extra cost in trying to influence decision-making within a privatized enterprise because of the subsidy needed to compensate the private owner to maintain excessive labor. Secondly, whenever $\xi < \theta$ holds, the transferring a larger portion of the enterprise's cash flow to

the manager, a larger α , increases the right-hand side of (2.7) and makes restructuring more likely.

Hence the analysis of Boycko, Shleifer and Vishny (1996) provides a straightforward explanation of when and how privatization can work: the government should relinquish control over the enterprise and furthermore have no incentives to subsidize it in exchange for not shedding labor. Subsidies tend to be more conspicuous and politically more detrimental than the unobservable profit that an overstaffed enterprise fails to earn. Therefore privatization effectively insulates the enterprise from political influence and fosters restructuring.¹¹ Furthermore, the argument implies fast privatization with quick transfer of control rights to private owners. Boycko, Shleifer and Vishny (1996) reject the idea that state-owned enterprises should be restructured before being sold, arguing that such a plan is based on the wrong assumption that governments maximize social welfare. Government officials, the authors assert, cater to their constituencies and would therefore readily subsidize loss-generating enterprises.

The model, however, ignores the idea that the government might simply be a bad owner who is lacking know-how, access to markets, managerial skills and other qualities that private investors are more likely to possess and exercise. Yet this might well be the main reason why after an enterprise moves to the hands of a private owner its performance improves. Furthering a bit the model of Boycko, Shleifer and Vishny (1996) provides the following intuition: the new owner's payoff is, most plausibly, an increasing function of both subsidies from the government and the profits of the enterprise. To

¹¹ The need to insulate enterprise from political influence has been discussed by Schmidt (1996) and Shapiro and Willig (1990). According to these authors, privatization reduces the information available to politicians about the enterprise's operations. Boycko, Shleifer and Vishny (1996) disagree with the assumption that politicians lose any information about the enterprise upon privatization.

increase the profits of the enterprise, however, requires effort, which the owner may prefer not to exert, if she could obtain the same payoff by extracting larger subsidies from the government. In other words, the owner may prefer to rely on the soft budget constraint, instead of exerting more effort in improving the enterprise's productivity.

Privatization, as modeled in the work of Boycko, Shleifer and Vishny (1996), makes government's subsidies more costly for the government, which is represented by the term $\alpha\theta$ above. Given this expectation of less government's subsidies, i.e. hardened budget constraint, the new owner may well prefer to put more effort and improve the performance of the enterprise. Importantly, this reasoning is not related to the level of employment. The assumption that private ownership in itself increases productivity because it is associated with better management, which in turn makes private enterprises relatively more profitable, is the key assumption behind the signalling model presented in sub-section 3.2.2.

Arguments that privatization might not work all that well, however, are easy to develop. Aghion and Blanchard (1998) show that if insiders acquire an enterprise, just like the government they might prove inefficient managers because they often pursue goals inconsistent with profit-making, such as excessive employment or empire-building. Insiders might entrench themselves and thereby prevent outside owners, who are presumably more efficient, from acquiring the enterprise. On the other hand, in a framework related to Aghion and Blanchard (1998) and Boycko Shleifer and Vishny (1996), Debande and Friebel (1997) show that insider privatization might have either positive or negative effect on performance. The following two subsections offer brief

presentations of the models of Aghion and Blanchard (1998) and Debande and Friebe (1997).

2.3.2 Privatization to Insiders: The Entrenchment Effect

Aghion and Blanchard (1998) assume that an enterprise sold to insiders, managers and/or workers, yields an inefficiently low but positive level of output of L per worker, where $0 < L$. If outsiders acquire the enterprise, they would replace a fraction k of the enterprise's workforce, the latter being normalized to 1, in order to boost performance to H per worker, where $0 < L < H$. Workers that remain in the restructured enterprise obtain a wage w , while the sacked workers obtain unemployment benefit b , where $w = b + c$. The parameter c is positive. The outside investor is thus willing to pay at most $H - w$ for the enterprise if and only if $H > w$.

Assume that the enterprise's workers decide collectively on its fate. In that case, they would sell the enterprise if and only if $kb + (1 - k)w > L$ or, equivalently, if

$$(2.8) \quad w - kc > L.$$

Therefore the enterprise would be sold if the condition $H > L + kc$ holds. In other words, despite the potential gains from trade, i.e. $H > L$, the term kc makes it less likely that the enterprise moves into the hands of the more efficient outside owner. An increase in either the wedge between the efficient wage w and the unemployment benefit b , represented here by c , or in the fraction of laid off workers, k , effectively serves as an entrenchment device, hindering efficiency-improving trade.

In fact, any factor that affects the highest price outsiders are willing to pay, $H - w$, and/or the lowest price that insiders are willing to accept, $L - w + kc$, affects the chances

of successful sale. For example, higher unemployment rate would lower b , while macroeconomic instability would make the outsider's payoff less certain. In either case, it is straightforward to show that the size of the expected gains from trade shrinks.

2.3.3 Privatization to Insiders: Asset Stripping and Soft Budget Effects

Debande and Friebel (1997) present a model in which both the government and the management might be interested in inefficiently high employment levels. The government might naturally seek higher employment in order to improve its electoral prospects, while the management might be captured by its workforce or might have 'empire-building' motives. Initially, the enterprise is not restructured, employs too much labor, which is denoted by L , and generates a profit denoted by $\Pi(L)$, such that $-1 < \Pi(L) < 0$. Restructuring requires one unit of capital, which is readily provided by the government, and effort exercised by the manager, which is denoted by e , such that $0 < e < e^*$ and possibly some layoffs.

If the manager chooses to exert no effort and no workers are laid off, the status quo prevails and the owner of the enterprise obtains $\Pi(L)$, If the manager exerts no effort but the excess labor is cut, then the enterprise yields positive profit $\Pi(0)$, such that

$$(2.9) \quad 1 < \Pi(0) < 2.$$

If the manager exerts effort, full restructuring is achieved and no workers are laid off.

This is the best outcome, it generates profit denoted by $\Pi(e, L)$, such that

$$(2.10) \quad \Pi(e, L) > \Pi(0) + 1.$$

Both the government and the manager obtain positive benefits from excess labor. Specifically, the government's payoff from excess labor is G_L , such that $1 < G_L < 2$ and the manager's payoff from excess labor is M_L , such that $0 < M_L < 2$. It is also assumed that once the government privatizes the enterprise, it effectively transfers both cash flow and control rights to the manager. The manager in turn can decide to strip assets, i.e. siphon off the government's loan. It is obliged, however, to return any loans the government has extended out of verifiable profits. Finally, it is assumed that the government does not observe the manager's effort, e .

Debande and Friebe essentially identify ranges of the parameters introduced in the preceding paragraphs, for which privatization ensures that the manager exert effort.

Consider first the manager's incentive to work hard under state ownership, i.e. when the government retains both cash flow and control rights. In this case, the government might be of two types: it might prefer to 'stabilize' its budget, i.e.

$$(2.11) \quad \Pi(0) + G_L < \Pi(L),$$

or it might seek to maximize employment, i.e.

$$(2.12) \quad \Pi(0) + G_L > \Pi(L).$$

If the government maximizes employment, then the manager has no incentive to work hard since the government would not lay off any workers, regardless of the enterprise's profit. Hence the manager's optimal effort is zero. On the other hand, if the government

seeks to balance its budget, then the manager might prefer to exert some effort in order to prevent dismissal of workers. Specifically, in this case the manager would work hard if and only if $M_L > e$.

Second, consider the manager's incentives under privatization. After the government invests one unit of capital, the manager might divert the funds or work hard and fully restructure the enterprise without sacking any workers. In the latter scenario, the manager's payoff is

$$(2.13) \quad \Pi(e, L) + M_L - e - 1.$$

If the manager diverts the initial unit of capital provided by the government, she asks for another unit and decides whether to layoff workers or to maintain excess employment.¹²

Note that the government is willing to refinance the enterprise and obtain $\Pi(0)$, which the manager is obliged to return as it is the observable profit in the case when excess labor is cut, or G_L , the government's payoff from excess labor. This is an instance of the soft budget constraint model of Dewatripont and Maskin (1995)¹³ – after sinking the first unit of capital, the government is willing to provide a second unit, which is inefficient from ex ante point of view, since both G_L and $\Pi(0)$ are less than 2.

After obtaining the second unit of capital, the manager can maintain excess employment, if $\Pi(L) < M_L$, or layoff workers, if $\Pi(L) > M_L$. In the latter case the

¹² The manager can also decide to fully restructure the enterprise, i.e. exert effort and maintain employment, after the government extends the second unit of capital. In this case, however the manager has to return the two units of capital and thus her payoff is $\Pi(e, L) + M_L - e + 1 - 2$, i.e. the same as the payoff from restructuring with one unit of capital in the first period. It is assumed here that if the manager prefers full restructuring than she restructures after obtaining the first unit say because, say, waiting results in an infinitesimal but positive cost of ε .

¹³ The soft budget constraint phenomenon and the model of Dewatripont and Maskin (1995), in particular, are further discussed in Chapter four.

enterprise, of course, generates $\Pi(0)$, but this is a verifiable profit that the manager is obliged to return to the government to repay the loans.

From this reasoning it follows that the manager would exert effort and fully restructure a privatized enterprise if and only if $\Pi(e, L) + M_L - e - 1 > \max\{\Pi(L) + M_L; 0\} + 1$ or, after rearranging, if

$$(2.14) \quad \Pi(e, L) + M_L - \max\{\Pi(L) + M_L; 0\} - 2 > e$$

Comparing this last condition on e with the condition $M_L > e$ derived under state ownership reveals the effects of privatization in the model. Specifically, if the government seeks to maximize employment, while the manager seeks to maximize profit then $\Pi(e, L) + M_L - 2 > M_L$, which means that privatization leads to full restructuring. On the other hand, if the government seeks to balance its budget and the manager seeks to maximize employment, then the condition for the manager to exert effort is $\Pi(e, L) - \Pi(L) - 2$, which can be lower than M_L and thus worsen the investor's incentive to restructure under privatization compared to state ownership. In either case, the manager would prefer to strip assets and demand subsidies from the government.

In conclusion, the model of Debande and Friebe shows that privatization can have positive effects even when the enterprise is sold to insiders, provided that the government's inclination to cater to workers' preferences is stronger than the manager's inclination to do so. Alternatively, the environment is more conducive to asset stripping. This might be the case because, for example, uncertain economic conditions make it more likely that managers would be unable to appropriate the benefits from their restructuring efforts, or the emergence of soft budget is more likely, because for example

the government is unable to commit itself not to bail out the loss-making enterprise. Under such conditions privatization is less likely to enhance performance.

The prediction of improved performance after privatization is largely consistent with the available empirical evidence (e.g. Megginson and Netter 2001). Just to mention one example, Frydman et al (1999) find that privatization adds 10 percentage points to the growth of revenues of firm privatized by outside owners in Central Europe.

2.4 Discussion

Many of the empirical findings reported in section 2.2 correspond well to what policy analysts and reformers expected, or are easy to explain with the wisdom of hindsight. In most cases, privatization changed the incentives of enterprise owners and managers, depoliticized decision making and resulted in improved performance. As expected, outsiders, particularly holders of large stakes, and market competition boosted restructuring activities. To a large extent, hard budgets had similar positive effects. As explained ex post by the models of entrenchment of Aghion and Blanchard (1998) and Debande and Friebel (1997), however, privatization to insiders might turn problematic since these owners may refuse to transfer enterprises to more efficient outside owners.

On the other hand, it is straightforward to attribute the under-performance of privatized enterprises in Russia and other CIS members, to these countries' lack of effective market institutions and deficient rule of law, in general, and the poorly implemented rules of corporate governance, in particular.

However, the finding that partial privatization had positive effects, result five from the list reported by Djankov and Murrell (2002), is surprising.¹⁴ Indeed, although state involvement was deemed the core factor behind enterprise inefficiencies, partially privatized enterprises were shown to perform just as well, and often even better than, fully privatized enterprises in developed capitalist economies and transition countries alike.

Specifically, Megginson, Nash and van Randenborgh (1994) study the pre- and post-privatization financial and operating performance of 61 companies from 18 developed countries and 32 industries that have been fully or partially privatized during the period 1961 to 1990. They report strong performance improvement for both partially and fully privatized enterprises. The important piece of statistics in their paper, however, concerns the pre-privatization performance indicators. The following table presents performance changes after privatization for both fully and partially privatized enterprises.

¹⁴ I thank Sujoy Mukerji for emphasizing this fact and suggesting a possible explanation.

Performance Variables and Subsamples Examined	N	Mean Before (Median)	Mean After (Median)	Mean Change (Median)	Z-Statistics for Difference in Medians (After-Before)	Percentage of firms that changed as predicted	Z-Statistics for Significance of Proportion Change
(1) Return on sale							
- Full divestiture companies	23	0.0537 (0.0538)	0.0765 (0.0611)	0.0228 (0.0164)	2.114 ^b	78.3	3.286 ^a
- Partial divestiture companies	32	0.0561 (0.0429)	0.0824 (0.0594)	0.0263 (0.0128)	2.160 ^b	62.5	1.461
(2) Sales Efficiency							
- Full divestiture companies	14	0.9396 (0.9321)	1.048 (1.042)	0.1082 (0.1110)	3.010 ^a	92.9	6.230 ^a
- Partial divestiture companies	21	0.9760 (0.9640)	1.072 (1.112)	0.1052 (0.1305)	2.360 ^b	90.5	6.321 ^a
(3) Capital Expenditure to sales							
- Full divestiture companies	16	0.0873 (0.0612)	0.1997 (0.1071)	0.1124 (0.0226)	2.82 ^a	87.5	4.536 ^a
- Partial Divestiture companies	27	0.1344 (0.0823)	0.1507 (0.1350)	0.0163 (0.0130)	1.045	55.5	0.575
(4) Real sales							
- Full divestiture companies	23	0.8759 (0.8624)	1.188 (1.158)	0.3120 (0.2333)	3.726 ^a	87.0	5.264 ^a
- Partial divestiture companies	34	0.9140 (0.8996)	1.108 (1.100)	0.1937 (0.1689)	3.026 ^a	67.7	2.200 ^b
(5) Total Employment							
- Full divestiture companies	15	44,520 (37,870)	50,710 (45,730)	6,188 (1,754)	1.164	73.3	2.043 ^b
- Partial divestiture companies	24	38,560 (14,360)	38,510 (15,000)	-55 (37)	0.071	58.3	0.828
(6) Debt to assets							
- Full divestiture companies	22	0.6940 (0.7640)	0.6753 (0.7071)	-0.0187 (-0.0233)	-1.558	72.7	2.394 ^a
- Partial divestiture companies	31	0.6396 (0.6240)	0.6114 (0.0634)	-0.0283 (-0.0234)	-1.793 ^c	71.0	2.572 ^a
(7) Dividends to sales							
- Full divestiture companies	14	0.0049 (0.0010)	0.0321 (0.0242)	0.0272 (0.0190) ^d	3.200 ^a	92.9	6.228 ^a
- Partial divestiture companies	25	0.0173 (0.0086)	0.0289 (0.0177)	0.0116 (0.0086)	3.363 ^a	88.0	5.847 ^a

^a Indicates significance at the 1 percent level.

^b Indicates significance at the 5 percent level.

^c Indicates significance at the 10 percent level.

^d Indicates that the difference between the median changes in dividend policy for companies undergoing full privatization is significantly larger than for firms undergoing partial privatization, at the 10 percent significance level.

Source: Megginson, Nash, and Van Randenborgh (1994).

The first thing to note in this table is that partial privatization improves performance just as well as full privatization. Moreover it does better with respect to returns on sale, sales efficiency, and debt to assets. The most relevant result is that pre-privatization performance of partially privatized enterprises is almost invariably better.¹⁵ Partially privatized enterprises have had higher return on sales, sales efficiency, real

¹⁵ The authors do not give the standard errors of their results, hence it is difficult to report on levels of significance.

sales, dividends to dates, and lower debt to assets and total employment before divestiture.

One plausible explanation of these numbers is that governments have kept stakes in better enterprises. The next chapter develops two models that show that the government may indeed want to do so in order to signal the value of the enterprise to potential private investors.

2.5 Conclusion

This chapter offered a brief review of the empirical literature dealing with post-privatization firm performance and a selection of the main analytical models that explain performance improvement or the lack thereof. Many of the empirical results on privatization seem consistent with the predictions of these models. Other results were easy to explain after the fact. Yet some observations remain puzzling.

In particular, the finding that the post-privatization performance of partially divested enterprises turns out to be surprisingly good was not expected by policy makers and analysts, neither is it consistent with the existing formal models. Models that suggest that privatization insulates enterprises from political interference clearly fail to account for this outcome. Furthermore, to the extent that governments privatize enterprises in order to raise revenues, partial privatization is not an optimal strategy. Indeed for governments in countries that have to serve huge foreign debts, for example transition countries, privatization was considered an important source of revenue.

Under certain assumptions, however, partial privatization might be a revenue-maximizing strategy. Governments that attempt to fully divest an enterprise may raise the

suspicion that the enterprise in question is difficult to restructure and investors who acquire stakes in it would fail to generate sufficient profits. Many enterprises in transition countries were burdened with hidden liabilities or were entangled in networks of loans involving other bankrupt enterprises or non-viable commercial banks. In such circumstances, it has been extremely difficult for outside investors to assess the future profitability of these enterprises.

As the next chapter argues however, if the selling government decides to stay involved, by selling only a part of the enterprise, it could credibly prove to potential investors that the enterprise is a viable one. Hence partial privatization could be a reform strategy designed to overcome informational asymmetries related to the expected profitability of enterprises slated for privatization.

Chapter 3 – Signalling Through Partial Privatization

3.1 Introduction and Relation to the Literature

This chapter presents two simple formalizations of the idea that under certain conditions a government seeking to privatize an enterprise would have to retain a stake in that enterprise in order to attract investors. The reason for this is that a potential investor might need a credible signal from the selling government, indicating that the enterprise slated for privatization is a viable one. In both models the government is assumed to possess superior information about the quality of state-owned enterprises or about future policies that are likely to affect the enterprise's profitability. Hence, partial privatization could be a second-best reform strategy in settings riddled with such informational asymmetries.

The primary goal of the present analysis is to explain the puzzling empirical observation that partially privatized enterprises tend to perform just as well as fully privatized enterprises, and very often perform even better than the latter. The argument proposed in this chapter would imply that partially privatized enterprises were better performers already prior to privatization and that it is not the case the government involvement somehow improves efficiency. Chapter four reported empirical evidence suggesting that this was indeed the case.

Partial privatization poses a second puzzle, however. Privatization programs are designed to achieve at least two primary goals. First, to improve enterprise efficiency, which is assumed to be hindered by the government's involvement in decision-making.

Second, to raise revenue. *Ceteris paribus*, partial privatization fails to fully achieve either of these two objectives. From the point of view of a reform-minded government, a state-owned stake in an enterprise would mean that decision-making in that enterprise is not insulated from political interference and therefore the enterprise would remain inefficient. Furthermore, full privatization, that is a 100% sale, would clearly raise more revenues than a partial sale.

The chapter also seeks to elaborate a simple policy-relevant idea that is again implied by the two models, namely that a successful privatization strategy would require the selling government to remain involved in the enterprise in order to credibly prove that it is not simply trying to get rid of a problem. Of course, the argument remains valid regardless of whether the seller is a government or a private entity.

The analysis in this chapter complements both the theoretical and empirical strands of the literature on privatization. On the theoretical side, as shown in chapter two, the influential analysis of Boycko, Shleifer and Vishny (1996) showed that private enterprises perform better than their state-owned counterparts because politicians find it more costly to pursue their political goals by influencing the decision making process of a private enterprise. Their analysis has been corroborated by most of the empirical investigations of post-privatization enterprise performance in advanced market economies (Megginson, Nash and van Randenborgh 1994), transition countries (Djankov and Murrell 2002) and elsewhere (e.g. Gupta 2001 on India). Boycko, Shleifer and Vishny, however, do not address the issue of the micro logic of successful privatization.

A successful privatization program obviously requires the endorsement of a reform-minded government. However, it also requires the ‘approval’ of at least two other

stakeholders – the potential buyer, who naturally cares about the enterprise’s future profits, and the enterprise’s employees who very often oppose privatization. While partial privatization might solve the asymmetric information snag with respect to the buyer, the employees’ acquiescence is often more difficult to secure. The two case studies presented in this chapter are meant to show that the preferences of the employees must be taken into account, or reformers would run the risk of having privatization derailed. Partial privatization, however, might be a solution to both problems. Partial privatization can be seen as a signal of enterprise quality and as a mechanism that commits the government to pursue policies that maintain high employment levels. The precise nature of the commitment property of partial privatization is investigated in greater detail in chapter four.

As mentioned before, the models presented in this chapter are analytically embedded in the theory of ‘transaction cost politics’ (North 1990 and Dixit 1996), or more generally in the formal analysis of the political economy of reforms. Chapter one argued that the theory of transaction cost politics, in part, seeks to explain why reforms that would pass the Kaldor-Hicks compensation test or even satisfy the more stringent Pareto criterion, often do not get implemented. Dixit (1996) argues that various interest groups with stakes in the status quo might block reforms because of problems related to *information-impactedness*, *opportunism* and *asset specificities*. Therefore, a reform-minded government is forced to deploy mechanisms of signalling (or screening), commitment and reputation building to deal with these problems. The models presented in this chapter deal primarily with information asymmetries. Although issues of

commitment and reputation naturally arise in the discussion that follows, apart from occasional speculation, this chapter does not explicitly deal with them.

The two formalizations are very closely related to the privatization models proposed by Perotti (1995) and by Li and Wang (2005). Perotti's paper shows that partial privatization may signal the government's commitment to carrying out future policies that would not negatively affect the enterprise that is being privatized.¹⁶ In his model partial privatization affects the incentives of the managers, which in turn affects the government's payoff. Unlike Perotti's model, the models in this chapter do not explicate the exact mechanism that affects firm performance. Sub-section 3.2.3 briefly summarizes Perotti's model and compares it with the models presented here.

Li and Wang (2005) study the obverse problem. In their model, the government is at an informational disadvantage vis-à-vis the enterprise manager, who is assumed to have superior information either about the enterprise value or about her managerial abilities. Partial privatization can serve as a screening device that 'extracts' information from the manager and thereby maximizes the government's second-best revenues. In the unique equilibrium outcome in the model of Li and Wang, the share that the government retains decreases as the enterprise value increases. However, the empirical literature reviewed in chapter two reports that partially privatized enterprises perform no worse than fully privatized enterprises and, furthermore, that partially privatized enterprises had better performance indicators *prior to* privatization. In contrast to Li and Wang's formalization, the models developed in this chapter yield outcomes in which the government's stake increases as the enterprise value increases.

¹⁶ I found Perotti's paper after I completed the model presented here.

More generally, the argument that ‘involvement’ can credibly signal ‘quality’, has been first proposed in the corporate finance literature. Ross (1977) constructed a signalling model to show that managers could credibly signal inside information regarding the profitability of an enterprise to other market participants by linking their remuneration scheme to the enterprise’s financial structure. In a related paper, Leland and Pyle (1977) showed that an entrepreneur might want to retain a share of his enterprise that is larger than what would be optimal in order to convince outside investors that the projects undertaken by the enterprise are profitable. Grinblatt and Hwang (1989) use similar logic to explain the under-pricing of new stock issues. As noted in Perotti (1995, p. 850, footnote 5) these models typically assume that the informed player is risk-averse, which is not an appropriate assumption when the informed player is a government, as is the case with privatization.

The chapter is structured as follows. Section 3.2 develops two very simple models to show how partial privatization might credibly prove quality. The first model assumes that a state-owned enterprise is certain to yield a positive profit, which might be either high or low, but only after a certain period of time. This delay captures the idea that the enterprise needs some restructuring. Without loss of generality, the restructuring expenses are assumed to be zero. The government is informed whether the profit would be high or low, but the potential private investor is not. Importantly, the government is assumed to be more ‘impatient’ than the investor. This condition is the key one – it implies that full privatization would be the first-best outcome.

The second model also assumes that the government is better informed about the firm’s profitability, but the two types of enterprise require strictly positive investments in

restructuring, the level of which is different for the different types. Both models generate equilibria in which the government retains a stake in the ‘good’ enterprise to signal enterprise’s quality and obtain a better price.

Section 3.3 presents Perotti’s model of ‘credible privatization’, which provides a complementary explanation of partial privatization, and Li and Wang’s (2005) model of partial privatization as a screening mechanism. Section 3.4 describes two recent instances of partial privatization, one of which was successful and one unsuccessful, in order to highlight that workers might play a pivotal role in privatization decisions and that partial privatization could be the result of workers’ resistance, rather than a signalling mechanism. These two case studies challenge the plausibility of the argument in this chapter and motivate the analysis presented in chapter four. Section 3.5 concludes the chapter.

3.2 Two Formalizations

The simple world analyzed in this section includes a reform-minded government that has decided to privatize an enterprise, and potential investors who consider whether and what share of the enterprise to acquire. Privatization might be full, whereby hundred percent of the firm is sold out, or partial, whereby the government retains a stake in the enterprise and the investor acquires the remaining part. The latter scenario includes no privatization as a special case. In both models, it is assumed that there are two types of enterprise, a *good* type and a *bad* type. Both types of enterprise eventually generate positive net

profits, but the net profit generated by the good type is higher. Furthermore, both types of enterprise generate profits *after* a period of restructuring.

The first model assumes that the level of restructuring is equal for both types. Without loss of generality, this level is set at zero. The second model assumes that the bad type requires more restructuring than the good type.

3.2.1 A Model with Impatient Government

In this model, the *good* enterprise generates a profit level denoted by G , while a *bad* enterprise generates a profit level denoted by B , such that $0 < B < G$. The government is fully aware of the type of enterprise it sells, while the investors know only the probability q that the enterprise is *good*. The profits become available after a period of restructuring. For simplicity, restructuring is assumed to be costless. In other words, the model has a temporal dimension, which affects the players' payoffs. Privatization, however, is modelled as a spot transaction, not as an interaction that unfolds in time.

The time dimension affects payoffs because of the players' different levels of 'patience.' More specifically, the government is less patient than investors, which is modelled by assuming that the government discounts the future by a factor of $\delta < 1$, while investors do not discount the future. This assumption is a crucial one, as it generates the gains from trade. Should the government decide not to privatize at all, its payoff, expressed as the net present value of the enterprise, is δG , if the enterprise is good, and δB , if the enterprise is bad. On the other hand, a good enterprise is worth G to an investor, while a bad enterprise is worth B to an investor.

If the informational structure of the interaction were complete and symmetric, both enterprises would be fully privatized, because $\delta G < G$ and $\delta B < B$, and the gains from trade would be divided according to the players' relative bargaining powers. This would be the first-best Pareto efficient outcome. Furthermore, if the informational structure of the interaction were such that both players did not know the type of enterprise, full privatization would still take place provided that

$$(3.1) \quad q\delta G + (1-q)\delta B < qG + (1-q)B,$$

which is clearly always the case. Hence, with symmetric but incomplete information the first-best outcome would prevail.

In the original setting of asymmetric information, however, should the government try to sell a good enterprise, the probability that investors assign to the event that the enterprise is indeed good, q , might be too low to generate such a price that the government accepts the sale. Specifically, asymmetric information would prevent the sale of a good enterprise if $qG + (1-q)B < \delta G$, which reduces to

$$(3.2) \quad q < \frac{\delta G - B}{G - B}$$

This example is essentially an instance of Akerlof's (1970) seminal 'lemons' problem. Condition (3.2) is assumed to hold throughout this sub-section.

The setting can be generalized by modelling the type of enterprise as a continuous variable. Following an example taken from Wilson (1995),¹⁷ assume that T is a continuous variable uniformly distributed between zero and one. In this case, an enterprise T is worth exactly T to the investors and δT to the government. Again the

¹⁷ Wilson (1995) in fact presents a simple version of the approach developed by Myerson and Satterthwaite (1983).

government is assumed to know the actual value of T , while the investors know only T 's distribution. Denote by $s(T)$ the probability that privatization takes place, and by $p(T)$ the expected price paid to the government. The government's expected net gain is $U^g = p(T) - s(T)\delta T$, while the investor's net gain is $U^i = s(T)T - p(T)$. In equilibrium, a government that sells an enterprise of type T should not find it optimal to mimic a government that sells an enterprise of type T^* . This incentive compatibility condition implies that $U^g(T) = \max_{T^*} [p(T^*) - s(T^*)\delta T]$ obtains its maximum at $T = T^*$. Differentiating $U^g(T)$ with respect to T and invoking the envelope theorem, results in

$$(3.3) \quad \frac{\partial U^g(T)}{\partial T} = -s(T)\delta$$

Furthermore, integrating U^g from zero to one yields¹⁸

$$(3.4) \quad \int_0^1 U^g(T) dT = U^g(1) + \int_0^1 s(T)\delta T dT$$

Finally,

$$(3.5) \quad \int_0^1 U^i(T) dT = -U^g(1) + \int_0^1 s(T)(T - 2\delta T) dT .^{19}$$

¹⁸ This expression is derived as follows. Note first that $\int_0^1 s(T)\delta T dT = \int_0^1 \frac{\partial U^g(T)}{\partial T} T dT$. Now integrating

the right-hand side of this expression by parts yields $-U^g(1) + \int_0^1 U^g(T) dT$.

¹⁹ The derivation of this expression goes as follows. Note first that

$$\int_0^1 U^i(T) dT = U^g(1) - U^g(1) + \int_0^1 s(T)T - p(T) dT = -U^g(1) - \int_0^1 s(T)T - p(T) dT + \int_0^1 U^g(T) dT - \int_0^1 s(T)\delta T dT$$

Now replacing $U^g(T)$ with $p(T) - s(T)\delta T$ and rearranging the terms under the integral

yields $\int_0^1 U^i(T) dT = -U^g(1) + \int_0^1 s(T)(T - 2\delta T) dT$, precisely the expression above.

Expression (3.5) implies that the investor would be better off by participating in privatization, that is by having $\theta < s(T)$ if and only if $\theta < T - 2\delta T$, or, equivalently, $\delta < \frac{1}{2}$. In other words, if information is asymmetric, privatization cannot take place if the government's discount factor is too large, in this example above $\frac{1}{2}$. In Wilson's (1995) words '... the cost of providing sufficient incentives to induce the seller to report truthfully exceeds the gain from trade.' Indeed, if the government's discount factor is too high, the gains from privatization become too small.

The scenario when T varies continuously is taken up again in the context of signalling, later in the section.

Building upon Akerlof's insight, Spence (1973, 1974) argued that in situations characterized by informational asymmetries, actors might try to signal information about parameters known to them, but not to others. In line with Spence's reasoning, the goal of the model in this section is to show that partial privatization can be such a signal.

In the case when the enterprise can be one of two types, either G or B , the analysis of signalling through partial privatization proceeds as follows. Denote by $(1 - \alpha)$ the share of the enterprise that the government decides to privatise and by α the share of the enterprise that the government retains. A share of the enterprise is taken to imply participation in the enterprise's net profit in proportion to that share. If an investor agrees to pay $P(1 - \alpha)$ for a share $(1 - \alpha)$, then the government's payoff would be $U^g(G) = P(1 - \alpha) + \alpha\delta G$, if the enterprise is good, and $U^g(B) = P(1 - \alpha) + \alpha\delta B$, if the enterprise is bad. The investor's payoff associated with a good and a bad enterprise would be $U^s(G) = (1 - \alpha)G - P(1 - \alpha)$ and $U^s(B) = (1 - \alpha)B - P(1 - \alpha)$, respectively.

The retained share α , in itself, cannot overcome the informational asymmetry. Specifically, a good enterprise would not be sold whenever the following condition holds

$$(3.6) \quad q(1-\alpha)G + (1-q)(1-\alpha)B + \alpha\delta G < \delta G,$$

which reduces to $qG + (1-q)B < \delta G$. This is precisely condition (3.2) that prevents the full sale of a good enterprise.

Assume, however, that the price paid does not vary with α , that is $P(1-\alpha) = \text{const}$. Then an increase in α has different marginal effects on the good and the bad type of government, namely, an incremental increase in α , increases the good type's payoff by an increment of δG , and increases the bad type's payoff by an increment of δB . In other words, if the price paid to either type decreased, the good type requires a smaller increase in α to maintain the same payoff, compared to the bad type. This amounts to Spence's single-crossing property, which allows for separation, as will be shown shortly.

To derive the equilibria of this model, it is necessary to make an assumption about the outcome of the bargaining that takes place between the government and the investors. For the sake of simplicity, and in line with an established tradition in the analysis of signalling games, the government is assumed to possess all the bargaining power. This assumption is justified if there is sufficient competition among investors so that they are forced to pay a price that is exactly equal to the value they attach to the enterprise. In other words, if investors are assumed to compete a la Bertrand.

The government's payoff when investors compete a la Bertrand depends on the investors' belief concerning the type of enterprise slated for privatization. If the investors believe that the enterprise is good when it is indeed good, then the government's payoff

would be $U^g(G, G) = (1 - \alpha)G + \alpha\delta G$. If the investors' believe that the enterprise is bad when it is indeed bad, then the government's payoff would be $U^g(B, B) = (1 - \alpha)B + \alpha\delta B$, (the first parameter in the government's payoff function indicates the type of enterprise, and the second variable indicates the investor's belief). Clearly both expressions are maximized when $\alpha = 0$, that is when the whole enterprise is sold. However, if the government is selling a bad enterprise, it would like to mislead the investors into believing it were selling a good enterprise, because $U^g(B, G) > U^g(B, B)$ for any value of α . In this case, the investor's belief would not be confirmed, therefore successful full privatization cannot be a sequential equilibrium in the sense of Kreps and Wilson (1982), or in the sense of the weaker notion of perfect Bayesian equilibrium (Tirole 1988, pp. 436-438). The concept of sequential equilibrium of Kreps and Wilson, requires an explicit specification of players' beliefs, in addition to an explication of their strategies. Roughly, in a sequential equilibrium, players' initial beliefs about the uncertain aspects of the game, in the model of this section the type of enterprise, are updated in a Bayesian way given the set of strategies players adopt in equilibrium. In addition, the equilibrium strategy of each player is optimal given her beliefs.

The sequential equilibria of signalling games in general, and the game in this section in particular, fall into three categories. Separating equilibria, where the informational asymmetry is overcome, pooling equilibria, where the informational asymmetry is not overcome, and semi-separating equilibria, where the informational asymmetry is only partially overcome. Semi-separating equilibria do not afford themselves to a straightforward interpretation, at least in the present context, hence the analysis that follows omits them.

Separation

In a separating equilibrium the investor learns the type of enterprise precisely. Denote the stake kept by the good type by α_G and the stake retained by the bad type by α_B . If the government sells a *good* enterprise, in a separating equilibrium it must be the case that the stake it retains, α_G , is such that mimicking the *bad* type would be unprofitable. On the other hand, were the government selling a *bad* enterprise, the stake it retains, α_B , should be such that mimicking the *good* type would be again unprofitable.

Given the assumption of Bertrand competition among investors, these two incentive compatibility constraints can be expressed as follows

$$(3.7) \quad (1 - \alpha_G)G + \alpha_G \delta B \leq (1 - \alpha_B)B + \alpha_B \delta B \quad (IC \text{ bad})$$

$$(3.8) \quad (1 - \alpha_B)B + \alpha_B \delta G \leq (1 - \alpha_G)G + \alpha_G \delta G \quad (IC \text{ good})$$

where *IC bad* is the incentive compatibility constraint of the bad type and *IC good* is the incentive compatibility constraint of the good type.

If the share kept by the good type drops to zero, $\alpha_G = 0$, then *IC good* would reduce to $G \leq (1 - \alpha_B)B + \alpha_B \delta B$ and *IC bad* would reduce to $(1 - \alpha_B)B + \alpha_B \delta G \leq G$. Taken together these two inequalities result in $\alpha_B \delta G \leq \alpha_B \delta B$, which is false by assumption. Thus incentive compatibility implies that in a separating equilibrium the *good* type should retain a positive share.

On the other hand, if the share retained by the bad type drops to zero, $\alpha_B = 0$, *IC good* and *IC bad* can be satisfied simultaneously. Indeed, in a separating equilibrium, it is

optimal for the government that sells a *bad* enterprise to sell it fully. It is the government that sells a *good* enterprise that needs to credibly signal its type. Therefore in a separating equilibrium $\alpha_B = 0$ and $\alpha_G = \alpha^S > 0$, where the superscript s stands for separation. *IC bad* and *IC good* become

$$(3.9) \quad (1 - \alpha^S)G + \alpha^S \delta B \leq B \quad (\text{IC bad separation})$$

$$(3.10) \quad B \leq (1 - \alpha^S)G + \alpha^S \delta G \quad (\text{IC good separation})$$

These two inequalities set an upper and a lower bound on α^S

$$(3.11) \quad \frac{G - B}{G - \delta B} \leq \alpha^S \leq \min \left\{ 1; \frac{G - B}{G - \delta G} \right\}$$

Any α^S in this interval corresponds to a different separating equilibrium.

To complete the characterization of the set of separating equilibria, assume that the investors' out-of-equilibrium beliefs attach a probability one to the event that the enterprise is bad. Finally, the individual rationality constraints, i.e. the conditions that the good and the bad type would prefer to privatise at all, are $(1 - \alpha^S)G + \alpha^S \delta G \leq \delta G$ and $\delta B \leq B$. These two inequalities are satisfied by assumption.

Pooling

In a pooling equilibrium the investor is unable to infer the type of enterprise. Therefore its updated belief is the same as its prior belief. Symbolically, $\alpha_B = \alpha_G = \alpha^P$, where the superscript p stands for pooling. To proceed with the characterization of pooling

equilibria, it is necessary to specify the investor's out-of-equilibrium beliefs. Since out-of-equilibrium play occurs with probability zero, Bayesian updating cannot be applied to infer these beliefs. The definition of sequential equilibrium allows for any possible out-of-equilibrium inference. Specifically, assume that for any α different from α^P , the investor concludes that the enterprise is certainly bad. With such a belief, α^P , is an equilibrium if and only if neither type would find it optimal to deviate by choosing to retain some different share. These restrictions again imply two inequalities for the good and the bad types, respectively

$$(3.12) \quad B \leq (1 - \alpha^P)[qG + (1 - q)B] + \alpha^P \delta B$$

$$(3.13) \quad B \leq (1 - \alpha^P)[qG + (1 - q)B] + \alpha^P \delta G$$

Inequality (3.13) is obviously redundant. Indeed, given the postulated out-of-equilibrium belief, it is most tempting for the government selling a bad enterprise to deviate and sell hundred percent of the enterprise. The first inequality then sets an upper bound on α^P

$$(3.14) \quad \alpha^P \leq \frac{q(G - B)}{q(G - B) + (B - \delta B)} < 1$$

Any α^P satisfying this inequality corresponds to a different pooling equilibrium.

To complete the characterization of the set of pooling equilibria, the individual rationality constraints of the good and the bad type are respectively given by

$(1 - \alpha^P)G + \alpha^P \delta G \leq \delta G$ and $(1 - \alpha^P)B + \alpha^P \delta B \leq \delta B$. These two inequalities are satisfied by assumption.

Least-cost separation

In reaction to the typical multiplicity of equilibria that arise in signalling games, game theorists have developed a plethora of equilibrium refinements that aim at pinning down a unique equilibrium. Usually, these refinements select the so-called least-cost-separating equilibrium, or the Riley equilibrium (Riley 1979). In this equilibrium outcome, the informed player's *good* type 'invests' in the 'signalling activity' just up to the point where the *bad* type would be deterred from mimicking the *good* type's strategy. The least cost-separating equilibrium of the model in this section is

$$(3.15) \quad \alpha^{LS} = \frac{G - B}{G - \delta B}$$

The identification of such a unique outcome is useful as it allows for comparative statics exercises. Straightforward calculations show that α^{LS} decreases in G and increases in B and decreases in the government's discount factor δ .

The most prominent refinement used to justify the selection of least-cost-separating equilibria in signalling games is the intuitive criterion of Cho and Kreps (1987). This refinement places restrictions on the out-of-equilibrium beliefs that support a given equilibrium. Specifically, if a certain deviation from equilibrium play can never benefit a certain type of the informed player, whatever the uninformed player does after observing the deviation in question, than the intuitive criterion suggests that the uninformed player should attach a probability zero to the type in question. If an equilibrium that is supported by beliefs that are unreasonable in this, then that

equilibrium is said to fail the intuitive criterion. In Spence's seminal job market signalling model, the intuitive criterion picks the least-cost separating equilibrium as a unique outcome.

To show that the intuitive criterion selects $\alpha^{LS} = \frac{G-B}{G-\delta B}$, consider first the set of separating equilibria. In fact, to eliminate all separating equilibria, except α^{LS} , it is enough to invoke a weaker concept, that of weakly dominated strategies.²⁰ For a share α larger than α^{LS} the bad type would strictly prefer the outcome $\alpha = 0$, in which the bad type obtains a payoff of B , to the outcome generated by $\alpha^{LS} < \alpha$, in which the bad type obtains less than $(1 - \frac{G-B}{G-\delta B})G + \delta B \frac{G-B}{G-\delta B}$. This claim follows from condition (3.9).

Hence for any $\alpha^{LS} < \alpha$, the investor should believe that the type of enterprise *cannot* be bad.

Second, consider the set of pooling equilibria. Take a pooling equilibrium α^{PP} , which satisfies (3.14) and consider a small deviation $\alpha^{PP} + \varepsilon$. The marginal effect of such a deviation on the bad type's payoff is $-B(1-q) - q(G-B) < 0$, while the marginal effect of the good type's payoff is $G(\delta - q) - B(1-q) > 0$.²¹ Hence only the government selling a good enterprise has an incentive to make such a deviation, provided that the investor believes indeed that the enterprise is good.

²⁰ In a signaling game, a strategy B is said to be weakly dominated by a strategy S for a certain type of the informed player, if for any pair of strategies chosen by the uninformed player, this type of uninformed player weakly prefers to choose strategy S to strategy B ; and for at least one strategy pair chosen by the uninformed player, this type of informed player strictly prefers strategy S .

²¹ This inequality holds by assumption, see Akerlof's lemons problem condition (3.2).

Finally, to complete the characterization of the least-cost separating equilibrium, note that the good type's individual rationality constraint, i.e. the constraint that ensures that the good type would not prefer to retain 100% of the enterprise, is satisfied since

$$(3.15) \quad \left(1 - \frac{G-B}{G-\delta B}\right)G + \frac{G-B}{G-\delta B}\delta G > \delta G,$$

always holds.

Similarly, the individual rationality constraint of the bad type is trivially satisfied since

$$(3.16) \quad \delta B < B$$

is true by assumption.

An example in which the type of enterprise varies continuously

Following Spence (1974, chapter three), and others (see e.g. Banks 1991), the model in this section can be generalized by assuming that the type of enterprise is a continuous, rather than dichotomous variable.

Denote again the type of enterprise by T . Denote the belief the investor forms about T upon observing α , by $f(\alpha)$. Given T and $f(\alpha)$ the government chooses α so as to maximise

$$(3.16) \quad (1-\alpha)f(\alpha) + \alpha\delta T$$

The first-order-condition for this programme is

$$(3.17) \quad \frac{\partial f(\alpha)}{\partial \alpha} = f(\alpha) \frac{1-\delta}{1-\alpha}$$

And the general solution of this first-order differential equation looks as follows

$$(3.18) \quad f(\alpha) = k \exp\left(\int \frac{1-\delta}{1-\alpha} d\alpha\right)$$

where k is a constant of integration. Now in a separating equilibrium the investor's belief should be correct, i.e. $f(\alpha) = T$. Making this substitution into (3.18), dividing both sides of the resulting expression by the constant of integration k , and taking logarithms to eliminate the exponential function, results in

$$(3.19) \quad \int \frac{1-\delta}{1-\alpha} d\alpha = \ln\left(\frac{T}{k}\right)$$

which, after solving the integral in the left-hand side, reduces to

$$(3.20) \quad \ln(1-\alpha) = -\frac{\ln\left(\frac{T}{k}\right)}{1-\delta} - C$$

where C is the another constant of integration. This is the closed form solution of α as a function of T . It implies that α increases in T .

The same result can be obtained more generally for both separating and pooling equilibria using the idea of *incentive compatibility*. Following for example (Banks 1991, p. 18), denote by $\alpha(T)$ the equilibrium stake retained by type T , and by $P(T)$, the equilibrium price offered by the investor. In equilibrium, no type should be strictly better off by following the strategy of some other type, which implies that for any two types T and T^* , the following incentive compatibility constraints should hold

$$(3.21) \quad P(T) + \alpha(T)\delta T \geq P(T^*) + \alpha(T^*)\delta T$$

$$(3.22) \quad P(T^*) + \alpha(T^*)\delta T^* \geq P(T) + \alpha(T)\delta T^*$$

The first inequality requires that type T do not have an incentive to mimic type T^* , while the second inequality requires that type T^* do not have an incentive to mimic

type T . By subtracting the right-hand side of the lower inequality from the left-hand side of the upper inequality and subtracting left-hand side of the lower inequality from the right-hand side of the upper inequality, these two inequalities reduce to

$$(3.23) \quad \alpha(T)\delta T - \alpha(T)\delta T^* \geq \alpha(T^*)\delta T - \alpha(T^*)\delta T^*$$

and further to

$$(3.24) \quad \alpha(T)(T - T^*) \geq \alpha(T^*)(T - T^*)$$

Since α is positive, $T > T^*$ implies $\alpha(T) \geq \alpha(T^*)$. Hence α increases in T .

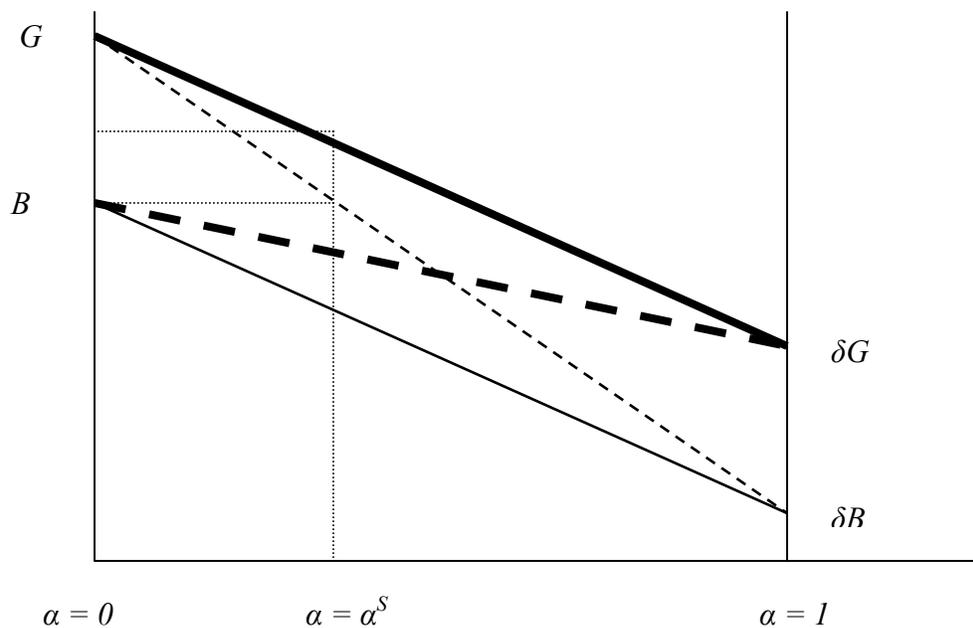
A graphical representation of the least-cost separating equilibrium

This section presents a graphical description of the preceding analysis. This representation makes it easier to visualise and track the effects of changes in different parameters on the equilibrium outcome picked by the intuitive criterion. Consider first the government's payoff as a function of the share α , conditional on the investor's belief. The analysis would focus only on separating equilibria, which means that there are four possible situations:

- i. If the government sells a *good* firm and the investor rightly believes that the firm is indeed *good*, then the government's payoff is $\alpha(\delta G - G) + G$. This is represented by '  ' in the figure below.
- ii. If the government sells a *good* firm, but the investor believes it sold a *bad* firm, then the government's payoff is $\alpha(\delta G - B) + B$. This is represented by '  ' in the figure below.

- iii. If the government sells a *bad* firm and the investor correctly believes that the firm is indeed *bad*, then the government's payoff is $\alpha(\delta B - B) + B$. This is represented by '—————' in the figure below.
- iv. Finally, if the government sells a *bad* firm, but the investor incorrectly believes it is *good* firm, the government's payoff is $\alpha(\delta B - G) + G$. In the figure below, this is represented by '-----'.

These payoff representations look as follows



In the graph, the least-cost separation equilibrium is represented by α^S , which is such that the *bad* type is indifferent between picking $\alpha = 0$, and revealing itself, and picking $\alpha = \alpha^S$, i.e. imitating the *good* type. It is also clear from the picture that the *good* type would prefer $\alpha = \alpha^S$.

How do changes in the parameters affect the equilibrium outcome?

An increase in the discount factor δ shifts the right-hand side intercepts of all curves. This shifts α^S to the right, i.e. the government is forced to keep a larger stake, but reduces the *good* type's equilibrium payoff. Importantly, the *bad* type's equilibrium payoff is not affected.

An increase in G shifts α^S to the right. Such an increase lifts right-hand intercept of the curve depicting the payoff of the *bad* type that is mistaken for the *good* type, but does not affect the right-hand intercept of the same curve.

Finally, an increase in B shifts α^S to the left. Such an increase lifts the left-hand intercept of the curve representing the payoff of the *bad* type that is correctly perceived as *bad*, by a proportion of one. On the other hand it lifts the right-hand side of the same curve by a proportion of δ only, which is less than one. As the picture is drawn, the leftward shift induced by the left-hand intercept increase on α^S more than offsets the rightward shift of α^S resulting from the right-hand side intercept increase.

A different refinement

As indicated above, the literature on equilibrium refinements is far from conclusive, except for suggesting that the choice of a particular refinement criterion should be motivated by the specificity of the situation being modelled. The intuitive criterion has been criticized for a number of reasons. Mailath, Okuno-Fujiwara and Postlewaite (1993) give an overview of these problems and suggest an alternative refinement, dubbed the undefeated equilibrium, which seems to bring the outcome of the model presented here in closer correspondence with reality.

The logical problems of the intuitive criterion and other related refinements stem from the fact that they do not fully investigate the consequences of the specific reasoning that players are supposed to go through to trim some equilibria. Particularly, in a signalling game the receiver is supposed to draw conclusions about the informed sender's type from the latter's out-of-equilibrium actions, but then the sender is not allowed to adjust her behaviour in anticipation of these conclusions. Mailath et al's refinement takes into account all adjustments concerning beliefs and actions that rational players would make if the game were common knowledge.

In addition to the logical inconsistencies inherent in the intuitive criterion, Mailath et al note that in games like the one studied here a very small proportion of 'bad' types in the population of senders brings about a sudden change in the equilibrium selected by the intuitive criterion. In a population of only good types the only plausible equilibrium is the pooling one in which the government sells the whole enterprise. However, the slightest probability of facing a 'bad' type already leads to separation. Such a 'discontinuity' is considered undesirable since the outcome of the model turns to be overly sensitive to small changes in the (imperfectly observed by the analyst) environment. The concept of *undefeated* equilibrium suggested in their paper is an attempt to deal with this (and other) problem(s).

Roughly, an *undefeated* equilibrium should satisfy the following criterion. If there exist another sequential equilibrium consistent with an out-of-equilibrium message such that the set of senders who send the message in question are also the set of senders that are better off at that alternative equilibrium, then the receiver's beliefs at the message in question in the original equilibrium should be consistent with that set of senders.

Otherwise the original equilibrium is defeated. The refinement thus requires that after all adjustments in actions and beliefs rational players with common knowledge of the game are made, the new situation should again be a sequential equilibrium.

Applying the concept of undefeated equilibrium to the particular game described in this chapter it can be shown that there is a cut-off value for q , denoted by q^* , such that for $q < q^*$ the unique undefeated equilibrium is a pooling one, and for $q > q^*$ the unique undefeated equilibrium is the least-cost-separating one. While for $q = q^*$ both equilibria are undefeated.

This seems a plausible scenario in the current setting, (although the ‘discontinuity’ is perhaps solved only from mathematical point of view, as it could be argued that the issue is, in a sense, left undetermined for $q = q^*$). Indeed under this refinement it takes a larger fraction of ‘bad’ enterprises to trigger separation.

Essentially, one has to find a cutoff value q^* above which the *good* type would prefer the *pooling* Pareto dominant equilibrium, i.e. the pooling equilibrium with the smallest possible fraction retained by the government $\alpha^P = 0$, to the least cost separating equilibrium. At the pooling where $\alpha^P = 0$, the government obtains

$$(3.25) \quad qG + (1 - q)B$$

while at least-cost separation it obtains

$$(3.26) \quad G \frac{G - B}{G - \delta B} + \delta G \left[1 - \frac{G - B}{G - \delta B} \right].$$

The former is larger than the latter for

$$(3.27) \quad q^* > \frac{G - \delta G}{G - \delta B} + \frac{\delta G - B}{G - B},$$

which represents the probability that the enterprise is good that separates the ranges of pooling undefeated equilibria and separating undefeated equilibria.

Straightforward, but algebraically tedious, calculations lead to the following comparative static results.

$$(3.28) \quad \frac{\partial q^*}{\partial G} = \frac{B(G^2 - \delta B^2)(1 - \delta)^2}{[(G - \delta B)(G - B)]^2} > 0$$

$$(3.29) \quad \frac{\partial q^*}{\partial B} = \frac{(G - \delta G)(1 - \delta)(\delta B^2 - G^2)}{[(G - \delta B)(G - B)]^2} < 0$$

$$(3.30) \quad \frac{\partial q^*}{\partial \delta} = \frac{(G - B)\{(G - \delta B)[G(G - \delta B) - G] + B(G - B)(G - \delta G)\}}{[(G - \delta B)(G - B)]^2} > 0$$

In other words, the concept of undefeated equilibrium yields results that are markedly different to the results suggested by the intuitive criterion. Pooling becomes possible. Specifically, as the difference between the values attached to the good and the bad type of enterprise increases, it becomes more likely that the pooling outcome prevails. Furthermore, as the government becomes more impatient, separation becomes more likely. Hence, if privatization is deemed an important source of revenues to the government, i.e. the government is more impatient, then the differences in performance indicators of fully privatized and partially privatized enterprises should become more pronounced.

3.2.2 A Model with More Efficient Private Owners

The model presented in the preceding sub-section relies on (at least) two assumptions that warrant caution: First, the government is assumed to be less patient than the investor.

Second, the two types of enterprise are assumed to yield the same level profits regardless of their ownership. The first assumption is clearly at odds with most models featuring the government as one of the active players, while the second one is at odds with the idea that enterprises markedly improve performance upon privatization due to the general perspicacity and better entrepreneurial qualities of most private investors. It is possible to recast the argument by dropping the first assumption and modifying the second assumption. This sub-section presents a formalization capturing the logic of such an argument.

As before, suppose the enterprise slated for privatization can be either good or bad. The government's and the investor's payoffs from owning 100% of the enterprise are such that privatization would generate surplus in either case, although it may not take place because of asymmetric information. The government is represented by a ruling politician. Specifically, assume the following profit levels

	Good enterprise	Bad enterprise
Investor	G^*	B^*
Government	g^*	b^*

Assume further that $b^* < B^* < g^* < G^*$. In other words, for both types of enterprise it is true that the investor is a better owner and would be willing to pay a price, which is higher than government's reservation price. If only the government knows the type of enterprise, while the investor only knows that the enterprise is good with probability q

then Akerlof's lemons problem would occur whenever $qG^* + (1-q)B^* < g^*$, or if

$$0 < q < \frac{g^* - B^*}{G^* - B^*} < 1.$$

Suppose however, much more plausibly, that both types of enterprise require some initial investment in restructuring, denoted by I , after which they yield the profits in the table above. There are two time periods in this model, but none of the players discount the future. The sole role of the time dimension in this setting is to introduce a wedge between the investment period and the period in which profits occur. The new situation looks as follows

	Good enterprise	Bad enterprise
Investor	$G - I = G^*$	$B - I = B^*$
Government	$g - I = g^*$	$b - I = b^*$

Assume further that the government can commit itself to cover a share in the restructuring expenses in proportion to its share of the enterprise α . This commitment might simply mean that the government covers its part of the investment at the time of sale. The most important assumption of the model is that the government assigns different values to a monetary unit spent on investments and a monetary unit of budget revenues. This assumption is in line with the argument advanced by Boycko Shleifer and Vishny (1996) that politicians with discretion over budgetary funds might attach different values to different allocations of these funds. In the context of the present model, the government's investment expenditures directly affect the budget, are quite conspicuous and the politician who commits such expenditures faces competition from other

politicians, representing other interest groups, in the allocation of the state budget. Furthermore, a politician who commits budget resources to investments in partially privatised enterprises, or in any other type of enterprise for that matter, might raise the suspicion that he is catering to the interests of a specific interest group, say the enterprise's workforce.

On the other hand, the government's share in the profit of an enterprise, or the lack thereof, affects politicians less directly and, in the context of the present model, after a period of time. One way to justify this assertion is to assume that there might be uncertainty regarding the factors that determine the enterprise's profits. In addition, and perhaps more plausibly, budget revenues from stakes in enterprises are less likely to be thought of as related in any way to politically motivated subsidies and would be politically less costly for politicians. The next assumption is that the politician's marginal cost from committing budgetary funds to investments is larger if the enterprise is of the bad type. Specifically, the pressure exercised by opposition parties or politicians representing rival interest groups is assumed to be more detrimental to the politician's career in case the enterprise for which the politician 'wastes' public funds proves to be less profitable. Symbolically, the politician's marginal cost of a monetary unit committed to investments is θ^G , if the enterprise is good, and θ^B , if the enterprise is bad, and the politician attaches a marginal value of k to budget revenues coming from either the sale of a stake in the enterprise or the profit that the government subsequently earns from its share α . The ranking of these marginal values is $0 < k < \theta^G < \theta^B < 1$. Finally, the selling government is assumed to be able to extract all gains from trade because investors compete a la Bertrand.

The separating and pooling equilibria of this game look are the following.

Separation

The incentive compatibility constraints for a separating equilibrium are

$$(3.31) \quad k(1 - \alpha^S)(G - I) + \alpha^S(kB - I\theta^G) \leq k(B - I),$$

$$(3.32) \quad k(1 - \alpha^S)(G - I) + \alpha^S(kG - I\theta^G) \geq k(B - I),$$

where the first inequality prevents the bad type from mimicking the good type, and the second inequality prevents the good type from mimicking the bad type. Assume also that for any out-of-equilibrium share, the investors' beliefs attach a probability zero to the event that the enterprise is good.

These two inequalities define an interval for α^S representing the set of separating equilibria, which looks as follows

$$(3.33) \quad \frac{k(G - B)}{k(G - I) - (kB - \theta^B I)} \leq \alpha^S \leq \min \left\{ 1, \frac{k(G - B)}{k(G - I) - (kB - \theta^G I)} \right\}.$$

Pooling

In a pooling equilibrium the good and the bad type retain the same stake α^P and the investor's updated belief remains the same as the prior belief. The investor's out-of-equilibrium belief, in case a stake different from α^P is offered, is that the enterprise is bad with probability one. The set of shares maintaining a pooling equilibrium is then determined by the following inequalities

$$(3.34) \quad k(B - I) \leq k(1 - \alpha^P)[q(G - I) + (1 - q)(B - I)] + \alpha^P(kB - \theta^B I)$$

$$(3.35) \quad k(B - I) \leq k(1 - \alpha^P)[q(G - I) + (1 - q)(B - I)] + \alpha^P(kG - \theta^G I),$$

which defines an interval for α^P

$$(3.36) \quad \alpha^P \leq \frac{kq(G-B)}{k[q(G-B)-I]+I\theta^B} < 1.$$

Any α^P in this interval corresponds to a different pooling equilibrium.

The least-cost-separating equilibrium, picked by the intuitive criterion of Cho and Kreps (1987) is

$$(3.37) \quad \alpha^{LS} = \frac{k(G-B)}{k(G-I)-(kB-\theta^B I)}.$$

Straightforward comparative static calculations show that α^{LS} decreases in k and in θ^B . In words, the larger the political cost of investing in a bad enterprise or the larger the marginal political benefit from budget revenues, the smaller the stake retained by the government.

To present the continuous version of the model, denote the type of enterprise by T , the politician's marginal cost of investment expenditures by θ^T and the belief the investors formulates after observing α , by $f(\alpha)$. The politician chooses α , which maximizes

$$(3.38) \quad k(1-\alpha)f(\alpha) + \alpha(kT - \theta^T I)$$

The first-order condition for this maximization problem is

$$(3.39) \quad \frac{\partial f(\alpha)}{\partial \alpha} = \frac{k}{1-\alpha} f(\alpha) - kT + \theta^T I.$$

In a separating equilibrium, the investor's belief should be correct, i.e. $f(\alpha) = T$. After making this substitution, the general solution of this equation becomes

$$(3.40) \quad f(\alpha) = T = (1-\alpha)^k \left[C + \frac{(kT + \theta I)(1-\alpha)^{1-k}}{1-k} \right],$$

where C is a constant of integration. This expression reduces to

$$(3.41) \quad T = \frac{\theta I(1-\alpha) - C(1-k)(1-\alpha)^k}{1-2k + \alpha k}.$$

This expression clearly increases in θ .

Finally consider the outcome selected by the concept of undefeated equilibrium proposed by Mailath, Okuno-Fujiwara and Postlewaite (1993). At the Pareto optimal pooling equilibrium, i.e. at $\alpha^P = 0$, the politician's payoff is

$$(3.41) \quad q(G-I) + (1-q)(B-I) = q(G-B) + B-I.$$

At the least-cost separating equilibrium, the payoff to a politician selling a good enterprise is

$$(3.42) \quad k \left[1 - \frac{k(G-B)}{k(G-I) - (kB - \theta^B I)} \right] (G-I) + \frac{k(G-B)}{k(G-I) - (kB - \theta^B I)} (kG - \theta^G I).$$

The threshold probability below which the only undefeated equilibrium is the Pareto optimal pooling one, and above which the only undefeated equilibrium is the least-cost separating one is given by

$$(3.43) \quad q^* = k \frac{G-I}{G-B} + \frac{k}{k(G-I) - (kB - \theta^B I)} (kG - I\theta^G) + \frac{B-I}{G-B}.$$

3.3 Two Related Models of Partial Privatization

3.3.1 Enrico Perotti's Model of Partial Privatization as a Signal

Perotti's model of partial privatization (Perotti 1995) envisages a mechanism of signalling through partial privatization that is closely related to the models presented in the previous section and indeed can be taken to complement these models in a certain sense. Perotti, however, seeks to explain a different empirical puzzle – the gradual nature of privatization and the underpricing of the shares sold – while the government in his setting signals to the investors its commitment to future policies, rather than the worth of the enterprise to the investor. This sub-section briefly presents Perotti's model and compares its key insights with those derived from the model in section 3.2.

Drawing on empirical evidence from the privatization programs in the UK and Hungary, Perotti's question is why privatization occurs only gradually through time (although control is oftentimes immediately transferred to private owners), given that it is expected to improve enterprise performance, and why essentially all initial privatization deals in the two countries had been partial. Secondly, Perotti seeks to explain why the sales of shares tend to be largely under-priced. His evidence bearing upon this fact is mostly from the British experience.

The key argument of the paper is that potential investors are not able to verify whether the selling government is committed to non-interference (modelled as expropriation of part of the firm's profit) after privatization, or is a populist government that would engage in redistributing the investor's share of the profit. The investor's expectations would affect her effort, which in turn would affect the enterprise's share price and profits in such a way that a committed government might prefer to initially sell

only part of the enterprise's shares if that would credibly signal its commitment to non-interference to the investor.

A stripped-down version of Perotti's model goes as follows. Assume that a government has to decide whether to fully divest an enterprise now or to sell only a fraction α of it now and sell the remaining part, $(1 - \alpha)$, in the second period. In either case, the government remains a passive actor, i.e. the new investor acquires full control over investment decisions. A committed government, denoted by C , has no interest in expropriating the firm's profit, while a populist government, denoted by P , would expropriate a fraction r of the profit in each of the two periods. The investor has to decide how much effort to put in managing the enterprise.

Assume that the enterprise's private share is a measure of the enterprise's gross profit, which is in turn directly measured by the investor's effort e .²² The investor's cost-of-effort function has a standard quadratic form, $e^2 / 2$. Thus, if the investor owns a fraction α of the firm its effort, and therefore the firm's value, is exactly α . The investor's cost-of-effort is fully compensated.

First, consider the situation when there is no informational asymmetry. If the government were committed and sells a fraction α , the period one enterprise's value, which is the sum of the gross profits over the two periods minus the respective effort levels, would be

$$(3.44) \quad \alpha - \frac{\alpha^2}{2} + 1 - \frac{1}{2}$$

²² This is a significant shortcut. Alternatively, the investor's effort, and thereby the firm's value, can be derived from more basic assumptions about the investor's payoff function (see Perotti 1995, pp. 851-852).

Similarly, if the government were populist and sells a fraction α , the enterprise's value in period one would be

$$(3.45) \quad \alpha(1-r)^2 - \frac{\alpha^2}{2}(1-r)^2 + (1-r)^2 - \frac{(1-r)^2}{2} = \left(\alpha - \frac{\alpha^2}{2} + \frac{1}{2}\right)(1-r)^2$$

Expression (3.345) takes into account the fact that the investor anticipates that a fraction r of the profit would be expropriated and adjusts its effort accordingly, to $\alpha(1-r)$. Obviously, expressions (3.44) and (3.45) are maximized by setting $\alpha = 1$, i.e. full divestiture.

It is also clear that the populist government would like investors to think it were a committed government. Therefore the committed government would need to credibly signal its type. The latter can achieve this by selling only a fraction of the enterprise, which is large enough to prevent the populist government from mimicking the committed one. By invoking the intuitive criterion of Cho and Kreps (1987), Perotti identifies the game's least-cost-separating equilibrium, in which the populist government fully divests the enterprise, obtaining a payoff of

$$(3.46) \quad (1-r)^2 + 2r(1-r) = 1-r^2$$

The populist government would not mimic the committed government if and only if the former is indifferent between $1-r^2$ and the payoff it would obtain should the investor believe, wrongly, that it was a committed government. The populist government's payoff in the latter case is

$$(3.45) \quad -\frac{\alpha^2(2r-1)}{2} - \alpha(1-r^2+2r) + \frac{1}{2} + \frac{r^2}{2},$$

which is equal to $1-r^2$ from (3.46) for²³

²³ Perotti's expression is in fact slightly different. I was unable to arrive at his result.

$$(3.45) \quad \alpha = \alpha^* = \frac{1 - r^2 + 2r - \sqrt{(1 - r^2 + 2r)^2 - 2(2r - 1)(1 - 3r^2)}}{2r - 1} P(1 - \alpha)$$

Expression (3.45) represents the share that the committed type of government sells in order to distinguish itself from the populist type.

Perotti goes on further to investigate what happens if the government is unable to transfer control to the new investor for the whole range of possible stakes between zero and one. In particular, if the smallest share needed for transfer of control is larger than a^p , for example above 50% of all voting shares, then the government might still be able to signal its commitment by under-pricing the sale. Such under-pricing is again supported by the evidence presented in his paper.

The empirical motivation of Perotti's paper and his puzzle are different to the ones tackled in this chapter. While his explanation is indeed persuasive, the evidence in his paper is drawn from the early period of privatization and does not deal with patterns of post-privatization firm performance. Thus the two arguments are in no way rival; they rather suggest the complexity of forces and different constellations of factors that might exhibit similar manifestations. At the end of the day, it is perhaps impossible to say what exactly determined this or that decision of a policymaker. To the extent that the two arguments might imply similar policy suggestions, they are better viewed as complementary, rather than contradictory.

3.3.2 Partial Privatization as a Screening Device: The Model of Li and Wang

The starting assumptions of the model of Li and Wang (2006) are to a large extent the exact opposite of the assumptions upon which the model in section 3.2 is built. Hence, not surprisingly, Li and Wang yield the opposite conclusions, namely that the government retains a bigger share if the enterprise is ‘bad.’ The types ‘bad’ and ‘good’ in their model refers to either the type of enterprise or the type of manager.

Li and Wang assume that the government is seeking to sell an enterprise to the enterprise’s managers. The managers are assumed to be better informed about their own qualities or the quality of the enterprise. Therefore the government might try to elicit this information by partial privatization. The model is one of screening, not signalling, which helps Li and Wang avoid the problem of multiple equilibria. Indeed, as in other screening models, they derive a unique equilibrium, which corresponds to the least-cost separating outcome in an analogous signalling set-up.

Specifically, Li and Wang assume a risk-neutral revenue-maximizing government official and a risk-neutral revenue-maximizing manager. The manager is due to implement a project that would yield a profit of $\Pi = e$, where e is the manager’s effort.²⁴

The manager’s cost function of effort is given by a quadratic function again

$$(3.46) \quad C(e, t) = \frac{e^2}{2t}$$

²⁴ Li and Wang assume that the profit has a stochastic element, i.e. $\Pi = e + \varepsilon$, where the stochastic variable ε is exogenous. The presentation in this sub-section ignores this stochastic part since it does not develop a full-fledged version of their model. In fact, simple incentive compatibility considerations prove enough to derive the relation between the manager’s type and the share of enterprise that is privatized in equilibrium.

where $t \geq 0$ is the manager's type, a parameter the government cannot observe. In a bid to elicit the manager's private information the government offers a contract consisting of a price paid to the manager, P , and a share of the future profit that the manager can retain, α .²⁵ The expected payoff of the government is given by

$$(3.47) \quad U^g = P(t) + [1 - \alpha(t)]e(t)$$

and the expected payoff of a type t manager is given by

$$(3.48) \quad U^m = -P(t) + \alpha(t)e(t) - \frac{e^2}{2t}$$

To derive the equilibrium share α as a function of the type t , it is sufficient to concentrate on the manager's equilibrium payoff function only.

Note first that the first-order condition for U^m with respect to e , $\frac{\partial U^m}{\partial e} = 0$, is given by

$$(3.49) \quad e = t\alpha(t)$$

Secondly, in equilibrium the manager's payoff should satisfy incentive compatibility. In other words, given any two types t^* and t^{**} , it should be true that neither type have an incentive to mimic the other type, i.e. the equilibrium contract should separate the two types. This requirement taken together with (3.49) imply the following two conditions

$$(3.50) \quad -P(t^*) + \alpha^2(t^*)t^* - \frac{[\alpha(t^*)t^*]^2}{2t^*} \geq -P(t^{**}) + \alpha^2(t^{**})t^* - \frac{[\alpha(t^{**})t^*]^2}{2t^*}$$

²⁵ Hence partial privatization implies that the manager obtains complete control rights regarding the firm's activities, while the government remains a passive player that participates in profit sharing only to the extent of its ownership share.

$$(3.51) \quad -P(t^{**}) + \alpha^2(t^{**})t^{**} - \frac{[\alpha(t^{**})t^{**}]^2}{2t^{**}} \geq -P(t^*) + \alpha^2(t^*)t^{**} - \frac{[\alpha(t^*)t^{**}]^2}{2t^{**}}$$

These two inequalities reduce to

$$(3.52) \quad \alpha^2(t^*) \left(t^* - t^{**} - \frac{t^*}{2} + \frac{t^{**}}{2} \right) \geq \alpha^2(t^{**}) \left(t^* - t^{**} - \frac{t^*}{2} + \frac{t^{**}}{2} \right)$$

and further to

$$(3.53) \quad \alpha^2(t^*)(t^* - t^{**}) \geq \alpha^2(t^{**})(t^* - t^{**})$$

Now since $\alpha^2(\cdot) > 0$, $t^* \geq t^{**}$ implies that $\alpha(t^*) \geq \alpha(t^{**})$. In other words, to elicit the manager's private information the government is forced to offer a contract such that the manager's share increases with the quality of the enterprise; hence the government's share decreases as the quality of the enterprise decreases. It is also clear that $P(t)$ is an increasing function.²⁶

Thus Li and Wang (2006) concludes that the contract offered by the government is so tailored that should the manager seek a lower price, then the government retains a larger share of the firm's future profit; and should the manager agree to pay a higher price, the government would retain a smaller share. Manager who know that they (or the enterprise) are 'good' would rather pay a larger price in exchange for retaining a larger share of the ex post profit. The opposite is true for managers who know to be 'bad.' The first best outcome is never achieved because the manager's incentive to input effort is dampened by the fraction of the profit that the government extracts in order to elicit the manager's private information.

²⁶ To derive this, note that the second incentive compatibility constraint, (3.41), can be rewritten as $2[P(t^*) - P(t^{**})] \geq t^{**}[\alpha^2(t^*) - \alpha^2(t^{**})]$. Now, since $\alpha(\cdot) > 0$ was shown to be an increasing function, it follows that if $t^* \geq t^{**}$ then $P(t^*) \geq P(t^{**})$, which proves the claim.

While such a screening model indeed offers an alternative explanation of partial privatization, its conclusions seem to be at odds with the observation that governments tend to retain stakes in enterprises that perform better. The model of Li and Wang, however, indicates how sensitive the results in this chapter are to the informational structure of the interaction. Indeed, managers certainly have informational advantage vis-à-vis the government and the reasoning of Li and Wang might well apply to privatization programs envisaging, for example, management-employee buyouts, or MEBOs. The informational assumptions Li and Wang make, however, would not apply when firms are being sold to outside owners.

3.4 Two Case Studies

Do these two models of signalling offer plausible insights into the process of privatisation and suggest reasonable policy prescriptions that governments trying to privatise state-owned enterprises could follow? This section briefly presents two case studies of recent privatization attempts, only one of which was successful, to shed some light on this question. The goal of these case studies is not to test the arguments presented in this chapter, but rather to gain insight into the real mechanisms that might lead to partial privatization. As it turns out, the mechanism suggested by the cases does not accord well with the idea behind the signalling models from the previous section, neither does it explain the empirical observations that motivated these models. The arguments developed in this thesis do not attempt to adjudicate between rival explanations of similar outcomes – such an account would require a more detailed empirical investigation.

3.4.1 Bulgaria's Bulgartabac and the Movement for Rights and Freedom²⁷

Bulgartabac is Bulgaria's state-owned tobacco monopoly. The company was created by the Communist regime in 1947, but tobacco growing remained relatively unimportant during the 1950s. The state provided substantial support to the sector and throughout the next decades Bulgartabac quickly adopted a leading position in Bulgaria's agricultural sector. During the 1980s, tobacco growing experienced a steady decline, which was attributed to at least three factors (Petkova and Yildirak 2003). First, the Communist regime of then Bulgarian leader Todor Zhivkov launched a series of repressive measures targeting Bulgaria's Muslim minority, which included most of the country's tobacco growers, resulting in a massive emigration of Muslims to neighboring Turkey. An estimated 300,000 people were forced to leave Bulgaria in the late 1980s, which markedly reduced the number of people employed in the tobacco sector. Second, inadequate management had resulted in huge cost inefficiencies and the continued employment of obsolete production equipment. Third, Bulgaria started losing its privileged markets in the countries from the Communist bloc, within the Council for Mutual Economic Assistance (COMECON), an organization created in 1949.

Nevertheless, by the late 1980s, tobacco-based products accounted for over 50% of Bulgaria's all agricultural exports. More than 80% of Bulgartabac's output was exported to the ex-USSR, mainly Russia, and Middle East countries. The company's USSR market was virtually insulated from competition, as tobacco producers from non-

²⁷ The historical account of this sub-section is based on (Petkova and Yildirak 2003). Unless indicated otherwise, the details on the attempts to privatize Bulgartabac after 2004 are based on the news archives of Sofia Echo, at <http://www.sofiaecho.com>, and the news archives of the BBC, at <http://www.bbc.co.uk>.

Communist countries were banned from exporting to the union. After the fall of Communism of 1989, Russia introduced a 150% import tariff on Bulgartabac's cigarettes in 1993, which led to a 75% drop in the company's total exports. Countries from the Commonwealth of Independent States, however, remained Bulgartabac's primary export markets.

Bulgaria's tobacco industry remains the primary source of income for the country's Muslim minority. In the late 1990s, an estimated 250,000 individuals were employed in tobacco growing, which constitutes 9% of the total number of employed people in the country. This makes Bulgartabac Bulgaria's largest single employer Petkova and Yildirak (2003). In some regions in southern Bulgaria with compact Muslim population, 90% of the workforce is involved in tobacco growing and processing. Tobacco growers receive tobacco seeds, fertilizers and technological guidance from Bulgartabac free of charge.

The Muslim part of the Bulgarian population is essentially the core constituency of the Movement for Rights and Freedoms (MRF), which became a coalition partner of the National Movement Simeon II (NMSS) after its electoral victory on 17 June 2001 and remained in the government led by the Bulgarian Socialist Party (BSP) together with NMSS after the general election of 23 June 2005. The MRF has been pivotal in Bulgarian politics during the whole transition period after the collapse of communism in 1989. The party's electoral platform centers on a single issue – improving the economic situation of the Muslim population in Bulgaria.

Muslims, however, remain the poorest section of the population. Their average wage is below the national one and most workers are not covered by any insurance

scheme after the social security reform of 2001. There is no alternative employment in the tobacco growing regions and unemployment is high. The work in the tobacco sector is entirely manual and family based. Households grow tobacco in small plots and large-scale production is very rare. Children and elderly people are routinely employed in some phases of the processing (Petkova and Yildirak 2003).

Bulgaria's tobacco sector is clearly in need of restructuring. The tobacco exports fell from 42,000 tones in 1992 to 21,000 tones in 2001. The export of cigarettes for the same period fell from 42,627 tones to 4,101 tones (some brands of cigarettes use higher quality tobacco imported from Greece). The financial results of many of the cigarettes producing plants of the holding exhibit continuous losses. About 70% of the tobacco brands grown in Bulgaria are oriental and the demand for these brands is falling worldwide. Only recently the cultivation of high quality light tobacco brands have been initiated. A long period of uncertainty about the future of the holding was associated with lack of investments in restructuring and mismanagement. In fact, the holding was involved in one of the most conspicuous corruption scandals in the country when the newly elected government tried to appoint a new board of directors in 2002 (Krastev 2004). Finally, as Bulgaria joined the EU on 1 January 2007, measures protecting Bulgartabac, and hence its employees, will have to be abolished.

Despite claims to the opposite, the MRF blocked three attempts to privatize Bulgartabac, excluding the privatization attempt of 2000 when the tender failed to attract any bidders. The motivation is allegedly entirely electoral – as a state owned enterprise, Bulgartabac ensures that tobacco growers have a stable market for their output. This is achieved through state-sanctioned quotas, minimum purchase prices and different

premium schemes. For example, there is an annually updated state-sanctioned price floor for tobacco leaves. The quality of Bulgarian tobacco leaves, however, is often so poor that the market is much lower than this price floor. Therefore the government is forced pay premiums directly to tobacco growers. (Petkova and Yildirak 2003) report that the total amount of subsidies paid by the government and tobacco dealers to tobacco growers reached around \$100m in 2000.

It should also be added that MRF is far from being the only party that wants Bulgartabac to remain state-owned. The company is well known as vehicle for providing illegal funding to a number of other political parties (Krastev 2004). That is why NMSS, a party formally established three months before the 17 June 2001 parliamentary elections, was the first government to make any serious effort to sell the holding in 2003.

Following two failed privatization attempts, in 1998 and in 2000, in January 2002, the government announced an ambitious plan to divest 51-80% of Bulgartabac to a foreign tobacco company or another 'strategic' investor. Around 13% of the company was to be floated on the Bulgarian Stock Exchange in order to boost trade on that stock market. The government, however, insisted on maintaining some control over decision-making by retaining a so-called 'golden share.' At the time it was unclear what type of decisions would be affected by this measure, neither was the government willing to elaborate on the employment and investment obligations the potential private owner would have to meet.

The first tender, launched in 2003, was for the whole holding. Importantly, the potential new owner was required not to sack any of the existing employees at Bulgartabac. Not surprisingly, no serious investors showed interest in the tender. A more

conspicuous privatization failure followed in 1 February 2005 when British-American Tobacco withdrew its \$200m bid for 3 of Bulgartabac's most profitable production facilities in Blagoevgrad, Sofia and Plovdiv. British-American Tobacco referred to "the difficult political environment" in Bulgaria as the reason for its withdrawal.

The three-party coalition government created in 2005 and led by the Socialists initially declared that it would privatize Bulgartabac as a whole, rather than in parts as envisioned by its predecessor, the NMSS government. This essentially implied that it would not privatize it at all. Indeed, the latest version of the government's strategy of 13 March 2006 says that the main goal is to restructure Bulgartabac in order to make it efficient, rather than privatize it. By the time of this writing (September 2007), the government had managed to sell via the stock exchange only 78.27% of Bulgartabac's Gotse Delchev Tabac subsidiary, which had been incurring continuous losses because of insufficient volumes of tobacco grown in the Gotse Delchev region.

3.4.2 Electricité de France²⁸

French energy giant Electricité de France (EDF) was established in 1946 by a Communist government after the nationalization and subsequent merger of almost all producers and distributors of electricity existing at that time. The nationalization program sought to dilute the perceived political influence of owners and managers of electricity utilities, to

²⁸ The historical facts described in this sub-section were retrieved from Electricité de France's website at <http://www.edf.com>, while the account of the recent privatization program, street protests and financial performance of EDF had been collated from the news archives of the International Herald Tribune, at <http://www.iht.com>, and the BBC, at <http://www.bbc.co.uk>. The interpretation of EDF's historical development, however, is taken from (Frost 1991).

facilitate economic growth, democracy and egalitarianism by bridging class divisions, and to ensure an aggregated financial resources needed for upgrading France's energy sectors (Frost 1991). By the end of 1950, EDF was operating on a national scale and was shifting from coal-based power stations to hydroelectric plants. Hydrocarbons began replacing hydroelectric power during the 1960s, and by 1973 around 50% of France's consumption of electrical power was accounted for by petroleum. The year 1969 saw the first labor agreement between EDF and its unions, which made wages partly dependent on the company's profit levels. Subsequently, unions have wielded substantial powers within the company's decision-making process, and the EDF exemplified the benefits of cooperation between technocratic management and workers (Frost 1991). EDF's first nuclear power plant was launched in 1963 in Chinon, the Vienne River valley and in 1984 the company helped China build its Daya-Bay power station. The oil price hikes of October 1973 forced France to start developing its nuclear power capacities to ensure its energy security and dependence on oil imports, a program headed by EDF.

Today, with a total capacity of 125.4 GW of electricity, Europe's largest, EDF is the major electricity utility in France and plays an important role in the energy markets of Germany, Italy and the UK, which makes it one of the largest electricity producers in the world. EDF contributed some 22% of the EU's electricity in 2003. Over 74% of EDF's energy output is generated by its 57 nuclear power plants. According to the International Energy Agency (2004), by 2004 the EDF's nuclear power plants accounted for 78.3% of France's total energy production. As of 2006, EDF employs 156,524 workers, of them around 106,560 people are employed in France.

EDF remained a government-controlled corporation until 2004 when it was transformed into a limited liability corporation in preparation for privatization. On 9 August 2004, the parliament passed legislation envisaging the divestiture of 30% of EDF. For an electricity monopoly, however, EDF was in a particularly poor financial situation. It had estimated debts of €24bn, while the worth of its assets was around €19bn. The credit ratings firm, Standard and Poor's claimed that EDF had off-balance-sheet costs to the tune of €22bn in connection with the planned decommissioning of nuclear power facilities in the coming years. This huge indebtedness had been tolerated by the government because of EDF's status of protected state monopoly. At that time, however, EDF was expected to lose its monopoly position in France as electricity supplier to business customers as of 1 July 2004, and to consumers as of 1 July 2007, as per the EU's directive on harmonization of the European energy market. In fact, EDF officials lamented already in 2003 that the company had lost around 25% of its customers, accounting for about 10% of its European market share because of the EU's liberalization bid. Thus the inherent characteristics of EDF, that is its expected profitability, posed the first obstacle to its privatization.

The second major obstacle to privatization came from EDF's French employees who feared that they would lose from the proposed privatization plan, as the immediate and obvious way to cut costs was to scale down the company's generous pension plans, reduce the level of employment and implement other similar measures; and from those who perceived EDF as a symbol of France's national pride and as a firm that is vitally important for the country's security. The reasons for the existence of such fears and perceptions could be perhaps gleaned from the EDF's history. In the 1940s, EDF was

conceived as a key element in France's strategy for overcoming its postwar backwardness, and indeed by the late 1940s EDF was among the most cost-effective electrical utility facilities in the world. Production efficiency coupled with the professional jargon of EDF's technocratic managers, which was incomprehensible to opposition politicians, helped the Communist Minister of Industry Marcel Paul to resist attempts by the opposition to obstruct the development and strengthening of EDF. According to Frost (1991), however, the state-controlled EDF in fact helped France establish a capitalist mode of economic organization, not a socialist, egalitarian one.²⁹ EDF's organizational structure was hierarchical and was based on technocratic principles, which required cooperative, rather than confrontational, stance with respect to workers. Therefore the latter gained substantial influence within the firm and secured financial benefits dependent on the company's performance. The labor's part of the deal envisaged acquiescence to the implementation of managerial modes that were more akin to a private company, and to any adaptation warranted by changes in the external economic environment. This deal in turn facilitated EDF's close alliance with and eventual subordination to the private sector and helped it become the key driving force behind France's economic progress after World War Two.

It could be argued then that EDF's important role in the French economy, its alleged commitment to social inclusion and amicable stance toward laborers, embodied in generous remuneration packages, pensions privileges and employment guarantees, to a large extent account for the strong opposition to the 2004-2005 privatization attempts.

²⁹ One of Frost's (1991) key arguments is that, contrary to the conclusions of other historical analyzes, EDF had actually catered to the interest of the French private sector in the postwar period.

Street protests against the EDF's partial privatization and work stoppages started as early as June 2004, with the Confédération Générale du Travail union being the most vocal opponent to the plan. Six French cities faced massive blackouts and the electricity supply to the houses of a number of senior government officials, including that of Prime Minister Jean-Pierre Raffarin, was temporarily cut. About 70,000 people held demonstrations across France (according to unions' estimates), and the company's energy output was reduced by some 12% due to the walkouts. EDF's employees had a large strike fund, reportedly among the largest in France, and could afford sustained action. Strikes and blackouts continued sporadically throughout 2005 and culminated weeks before 21 November 2005 when the government floated EDF's shares in Paris.

The workers partly achieved their goal. In response to the strikes and walkouts, instead of keeping 70% of EDF the government decided to retain 87.3% of it. Institutional investors could buy shares at €33 per share, while individual investors could buy shares at €32 per share. Institutional investors considered the price excessive, however, and the shares fell to €32.7 on the day of sale in Paris. The sale raised a total of €6.3bn, which was less than the €7bn the government expected. The investment banks that managed the sale had an option to buy part of the shares at a specified price, but the shares price fell so much that they preferred not to exercise 70% the options.

With the benefit of hindsight, however, it should be mentioned that the privatization of EDF had been largely successful in financial terms. According to recent reports (International Herald Tribune, 22 February 2007) EDF defied analysts' expectations by posting a net income of some €5.61bn in 2006, compared to €3.2bn in 2005, mostly due to increasing energy prices in markets outside France.

3.4.3 Discussion

Although these two cases are drawn from countries as different as one could wish for – post-communist Bulgaria and France, a developed market economy – workers have clearly played an important role in the two privatization decisions. EDF employees have been explicit and quite vocal in their opposition to privatization. Those dependent on Bulgartabac did not have to go to the streets, yet their influence was so much greater that no Bulgarian government managed to privatize any part the holding so far.

Bulgaria’s Muslim minority and the MRF essentially struck a political deal ‘stipulating’ that the MRF would receive the votes of its core constituency as long as Bulgartabac remains state-owned. Both sides have been immensely reliable in sticking to the terms of the deal. In turn, this apparently created the “difficult political environment” that scared foreign investors.

To overcome workers’ opposition, the government had to find a way to credibly commit itself to cater to their interests. Indeed the Bulgarian government tried to do so by including very restrictive clauses in the privatization contract of 2004. To the extent that the existing configuration of political forces guarantees the implementation of the contract, in such a key enterprise as Bulgartabac and given the pivotal political role of the MRF that was certainly the case, the commitment is credible. The failure of Bulgartabac’s 2004 tender, however, indicates that the government faced the flipside of the problem, namely: How to convince potential investors to buy an enterprise under such severe restrictions on their powers to fire and hire?

In fact, Bulgartabac's financial situation and its political importance were widely known to investors. Hence a partial privatization package, or any other form of privatization, would not signal anything new about the enterprise's quality as such. The only message that potential investors could retrieve from past behavior of the Bulgarian government is that Bulgartabac was too important to go bankrupt, and therefore subsidies, or other forms of government support, would most likely continue to flow toward the enterprise even after its privatization. In such circumstances, a rational forward-looking government might be reluctant sell Bulgartabac to investors who would *ex post* find it worthwhile to 'abuse' the enterprise's political value by extracting rents from the government. Although an argument in this spirit is advanced in chapter five of this thesis, it would be perhaps too farfetched to imbue the Bulgarian government with preferences that would call for minimizing the scale of expected rent seeking activities. Rather, the Bulgarian government, or in fact the pivotal MRF party, was allegedly acting upon its short-term preference to protect employment. Yet, already before Bulgaria's actual accession to the EU in January 2004, it was well known that the government's ability to disburse subsidies to tobacco growers would be limited. Admittedly, this last point assumes certain naiveté on the part of the Bulgarian tobacco growers.³⁰³¹

The privatization of EDF posed a related problem, but the French government managed to overcome it by reducing the stake it privatized. However, it is not immediately clear why EDF's French workers acquiesced when the government

³⁰ This is clearly at odds with the assumption that reform packages should be credible, in the sense discussed in section 4.1 of chapter one. One way to restore consistency in this part of the argument is to assume that the government is simply trying to postpone the painful cut in subsidies for as long as the EU allows it to. This strategy of delay is both transparent to the groups benefiting from such subsidies, and rational from the government's point of view.

³¹ The argument in this paragraph is based on a point raised by Magdalena Bernaciak.

eventually sold a share that was significantly smaller than what was planned originally. Chapter four provides a possible answer, arguing that the larger the government's stake, the softer is the budget constraint that the private owner faces. In turn, the soft budget encourages the initiation of more inefficient projects and higher employment.

3.5 Conclusion

Both theoretical and empirical analyses suggest that in most instances privatization can be thought of as a reform that passes the Kaldor-Hicks compensation test, i.e. the reform winners could in principle compensate the reform losers and still be better off. Privatization however rarely constitutes a Pareto improvement, whereby there are only winners and non-losers. Governments bent on privatization have to take into account the interests of at least two players – the potential investor and the workers – in designing a politically successful privatization program.

This chapter showed that potential investors must be convinced that the enterprise they acquire would bring them profit. If the selling government possesses superior information concerning either the enterprise's inherent characteristics or the government's future policies that bear on the enterprise's viability, then full privatization might be obstructed. Partial privatization can be a second best strategy, in which the government shows that it is willing to remain involved in restructuring the enterprise, and thus credibly signals its information.

A number of points warrant further elaboration of both theoretical and empirical nature. For one thing, the government might need to find a mechanism that commits it to its obligation to actually participate in the restructuring expenses proportionately to its

share. Secondly, it is perhaps somewhat implausible to assume that the government is more impatient than the potential investor (indeed, usually the opposite is assumed in formal models). The assumption, however, is a reasonable one in the case of a heavily indebted government, or a government that needs to quickly sell off the enterprise in question early in its term, so that voters ‘forget’ about it by the next election; or even before the next election, so that the ruling parties generate revenues for say campaign purposes.

Finally, the selling government must accommodate the demands of the enterprise’s employees, who often seek to scale down the government’s privatization plan by reducing the share slated for privatization. The chapter that follows is an attempt to explain why a larger state-owned stake in an enterprise is more likely to commit the government to take employees’ preferences into account.

Chapter 4 – Commitment Through Partial Privatization

4.1 Introduction

Workers often oppose privatization programs because the restructuring process that they expect to follow naturally raises concerns about layoffs. Hence both the selling government and the prospective investor(s) would need to credibly commit themselves to catering to the workers' preferences *ex post* if they want to (or have to) secure the workers' *ex ante* acquiescence. This chapter shows how partial privatization could serve as such a commitment mechanism.

All else equal, the government can achieve an employment level higher than the optimal by, say, subsidising the enterprise or otherwise interfering in the decision-making process, regardless of whether the enterprise is state-owned or private. Indeed, as Boycko, Vishny and Shleifer (1994) show, privatization makes difference only to the extent that the government finds it politically, and perhaps financially, more costly to affect employment by diverting treasury money toward subsidies than by setting employment level itself, thus reducing the treasury's revenues only indirectly.

In reality, however, the choice is not cast in terms of full privatization versus full state ownership. Rather the issue is oftentimes what share to be privatized. The case studies presented in the previous chapter indicate that governments tend to launch ambitious privatization programs envisaging the divestiture of large shares of key enterprises. This typically triggers lengthy debates and, often, street protests by workers. The opposition to the program might be less conspicuous than that however, and involve

workers implicitly indicating that the government, or a pivotal political actor, would lose their support should the privatization program be brought to fruition. Eventually, the government may scrap its privatization plan altogether or implement a less comprehensive program, for example by divesting a share that is smaller than the originally envisaged one.

It is not immediately obvious why workers would object to privatizing, say, 30% of the firm and later agree to having, for example, 12.8% of the enterprise privatized. What is it that credibly guarantees higher employment, should the state keep a larger share? The mechanism outlined in this chapter is the following: assume, following Boycko, Vishny and Shleifer's (1994) approach, that privatization implies full delegation of *control rights*, including rights over employment, project initiation and management, to the private investor in order to take full advantage of the investor's expertise, profit-maximizing incentives and overall perspicacity. Assume also that *cash flow rights* are allocated between the government and the investor according to their respective shares. In particular, these two assumptions mean that the investor has full discretion over what investment (restructuring) projects to pursue regardless of the size of its share, while the state remains a passive player who contributes to investment projects and benefits (or covers the losses, respectively) in proportion to its share of the enterprise. The analysis below tries to show that in this set-up, the smaller is the investor's share the larger is the *softness* of the enterprise's budget constraint, which in turn implies that more projects reach the implementation phase, which eventually implies higher employment.

The chapter proceeds as follows. Section 4.2 discusses two approaches to the soft budget constraint problem. Section 4.3 modifies the soft budget model of Dewatripont

and Maskin (1995) in order to explain when a larger state-owned share makes it more likely that the enterprise operates under soft budget. Section 4.4 discusses the commitment problems of the workers, i.e. what ensures that they would support the government that commits itself to soften the enterprise's budget. Section 4.5 concludes the chapter.

4.2 The Softness of the Budget Constraint

Kornai's conception of the soft budget constraint phenomenon (Kornai 1979, 1980) is based on the government's *paternalistic* incentives (Kornai, Maskin and Roland 2003). In Kornai's set-up the government is unwilling to let enterprises fail, 'The paternalistic state guarantees automatically the survival of the firm.' (Kornai 1979, p. 806) This 'negatively' affects the incentives of the managers of enterprises, be they private or state-owned. For example, if managers are not fully exposed to the consequences of unwise or economically unwarranted decisions, then they are also naturally more likely to take such decisions. Kornai's definition of the soft budget constraint is the following

A budget constraint is *hard* if it is asserted with iron discipline: the firm can spend only as much money as it has. It has to cover its expenses from its incomes from sales. It is entitled to take out credit, but the bank is prepared to grant credit only under "conservative" and "orthodox" conditions. This can be, therefore, only in advance for subsequent proceeds from sales.

The budget constraint is soft, if the above-mentioned principles do not get asserted consistently.

(Kornai, 1979, p. 806)

The key to understanding the behaviour of managers heading enterprises that operate under soft budgets is the *expectations* induced by the government's paternalistic concerns. Kornai speaks about an *attitude* on the part of managers, having in mind managers of socialist enterprises, which is exemplified by statements such as 'Let it cost what it may.'; 'The main thing is to acquire material and capacity, and money for it will be found in some way.'; 'Once we have a contractor, we shall not stop the investment just because we have no money,' and 'If these is a loss, the state budget will take it over.' (p. 807) Such an attitude, which is supported by the respective expectation, implies that enterprises would tend to enhance the scope of their operations without a bound, by undertaking too many inefficient investment projects.

The soft budget constraint mechanism has been invoked to understand not only the chronic shortages in former communist countries, but also a wide range of phenomena in contemporary capitalist economies, including bank crises and instances of the too-big-to-fail phenomenon. Examples of procrastination in such cases as, say, PhD thesis defense can also be thought of in terms of non-credible institutional commitment to enforcing the consequence of late submission.

Kornai's formulation leads to a straightforward policy recommendation: to fix incentives, governments should stop bailing out enterprises that perform poorly. It takes then a government with no paternalistic objectives to tackle the problem.

Schaffer (1989) presents a formal model, which captures the essence of this commitment problem. His formalization involves an enterprise E that considers whether to launch an inefficient project, which would certainly lead to losses, or whether to abstain from launching it. If the project is launched, the government, S , decides whether

to cover the project's losses, i.e. bail out the enterprise; or keep the budget hard, and thereby let the enterprise go bankrupt. If E abstains from launching the project, both E and S get payoffs of zero. If E launches the project and S covers the loss, E obtains $b > 0$ and S obtains $l < 0$. Finally, if E launches the project and S refuses to cover the loss, E obtains $t < 0$ and S obtains $k < l$.

Schaffer's (1989) model is an instance of a standard commitment problem. The game's unique sub-game perfect Nash equilibrium is: E launches the project and S covers the loss. Now, if $b + l < 0$, the outcome is socially inefficient. Yet S cannot prevent the emergence of this inefficiency because E knows that S would prefer to cover the losses. In equilibrium, E 's *expectation* is, of course, correct. If S were able to 'tie its hands' by showing that it would not cover E 's loss, S would be better off since E would not launch the project in the first place.

Schaffer also shows how S can build a reputation of being 'tough', if the game is repeated a finite number of times and if there exists some uncertainty about S 's exact preferences, i.e. with certain probability S might prefer to let loss-making enterprise go bankrupt. His formalization is essentially a modification of the reputation-building model of Kreps and Wilson (1982a).

The analyses of Kornai (1979) and Schaffer (1989) could be termed first-generation models of the soft budget constraint. Kornai sought to show how soft budgets led to chronic shortages in socialist economies, claiming that shortages were the defining feature of socialism. Schaffer sought to examine that exact mechanism that forces enterprises to behave inefficiently when their budgets are soft. However, the authors did

not deal with the government's incentives – their formulations simply assumed that the government is paternalistic.

The second generation of soft budget constraint models began with the seminal contribution of Dewatripont and Maskin (1995). They showed that the soft budget problem might run deeper than Kornai and Schaffer thought, because the softness of the budget could be a result of the government, or in fact any funding body, having purely economic, rather than paternalistic, objectives. Importantly, they clarified that such an outcome would prevail whenever the government's preferences exhibit *temporal inconsistencies*.

Specifically, if the funding body initially cannot distinguish between good (fast) projects and poor (slow) projects, then the *ex-ante* criterion for financing a project might well be different from the *ex-post* criterion, i.e. once the project type is revealed, of *re-financing* (or bailing out) the poor (slow) project. Anticipating such behavior, the management would be willing to request funding for poor projects and the funding centre would provide funding even if the projects are *overall* inefficient. Hence, for Dewatripont and Maskin (1995), an initial informational asymmetry coupled with a sunken initial investment, rather than just paternalism, are the key elements that constitute the causal mechanism of the soft budget constraint.

Their analysis implies the need for a more comprehensive policy reform because the softness of the budget stems from the institutional set up rather than from the policy choices of the funding body, be it a (post) socialist government or a private bank. In fact the second main goal of their paper is to show how the de-centralization of credit, i.e. an institutional reform, can harden the enterprises' budget constraints. With a slight

simplification of their set-up, it can be shown that the same argument is valid when the funding center is a government that faces an uncertain prospect of re-election and is therefore less likely to reap the benefits of a poor project.

The temporal inconsistency insight is particularly relevant in the present set up. A left-wing government could indeed be persuasive enough in claiming that the future owner of a enterprise slated for privatization would not be able to freely hire and fire, but workers might fear that the next election might bring a less ‘benevolent’ government. Shifting the burden of credibility to the investor and relying on its and the government’s profit-oriented incentives would better satisfy the workers. If the softness of the budget, which is taken here to imply higher employment, stems from the government’s economic rather than paternalistic incentives, then workers would be more inclined to accept partial privatisation. The next section formalizes this intuition.

4.3 A Formalization

This section examines three modifications of the basic soft budget constraint set up of Dewatripont and Maskin (1995) in order to identify conditions under which a smaller private-owned share implies softer budget and hence higher employment. More specifically, it is shown that a stake should imply involvement in both investment expenses and final profits for the argument to go through. If a ‘stake’ implies participation in the investment only then the government is naturally less inclined to participate in any project launched by the enterprise. More plausibly, however, if stake implies involvement in both investment and final payoff, than the larger the

government's stake the stronger its incentive to fund projects, including inefficient ones. Initially, the analysis focuses on linear specifications and then briefly discusses a simple non-linear specification of the set up.

Consider two players, a private investor I and a government G , holding shares of an enterprise E denoted by b and $(1-b)$, respectively, and interacting over two time periods without discounting. In the first period the investor decides whether to propose an investment project, while the government decides whether to allow the project to go ahead or not. If the government does allow the project to go ahead, it contributes to the initial investment, which is taken to be I . It is assumed initially that each player contributes to the required investment in proportion to its stake in the enterprise. In this setting therefore, the investor has *gate-keeping powers*, while the government has *partial veto power*, it can refuse to pay its share but otherwise cannot stop the project.

The project can be of two types. A good (fast) project is brought to successful completion after the first period and yields strictly positive payoffs Π_I and Π_G for the investor and the government, respectively. This ends the game. On the other hand, a poor (slow) project yields nothing after the first period. However, both the government and the investor know that an additional investment of size I would result in the poor project being completed after another period, which results in payoffs P_I and P_G , for the investor and the government, respectively.

Hence, should the project turn out to be poor, the government has to decide whether to contribute again or not. Should the government decide not to contribute, this would liquidate the project, yielding payoffs L_I and L_G for the investor and the government. Following Kornai, Maskin and Roland (2003), the government is assumed

to be able to mix between refinancing, which is played with probability s , a poor project and liquidating it, with probability $(1-s)$, in the second period. The parameter s can be thought of as a measure of budget's softness.

The government is unaware of the project type in period one, but attaches a probability a to the event of the project being good, and probability $(1-a)$ to the event that the project is poor. The good project's profit is ex post observable, and therefore the government learns the type of the project at the end of the first period. The investor, in contrast, is fully informed throughout the whole interaction. The appendix at the end of the thesis represents the game tree modelling the interaction.

Insert the figure from the appendix here

As the tree shows, nature moves first to choose whether the project at hand is good or poor. Thereafter the investor observes the project type and decides whether to pursue it or not. If the investor decides not to pursue the project, the game ends with payoffs of zero for each player. The government does not observe the project type, but should the investor go ahead with the project, it has to decide whether to participate in it or not. If the government refuses to participate, the project is terminated and both players obtain payoffs of zero. Should the government decide to participate, the good project yields payoffs $\Pi_I - b$ for the investors and $\Pi_G - (1-b)$ for the government, a poor project, on the other hand, does not yield anything. In the latter case, however, the investor may seek refinancing. If the investor fails to seek refinancing, the players obtain their liquidation payoffs minus the investment they have already made, i.e. $L_I - b$ for the

investor and $L_G - (1-b)$ for the government. If the investor requests refinancing, the government should decide whether to deliver the requested funding or not. In case of refinancing a poor project in the second period the payoffs of the investor and the government are $P_I - 2b$ and $P_G - 2(1-b)$, respectively.

As a first result, note that the investor would pursue a poor project whenever $s(P_I - 2b) + (1-s)(L_I - b) \geq 0$. There is thus a threshold of softness

$$(4.1) \quad s^* = \frac{b + L_I}{P_I - L_I - b},$$

above which the investor would submit a poor project. This threshold s^* is increasing in b , the investor's stake in the enterprise, whenever $2L_I > P_I$, which leads to the following claim.

Result 4.1

For a certain range of parameters, as the investor's stake increases, it takes a larger threshold level of softness on the side of the government to have the investor submit a poor project. Phrased differently, for a certain degree of softness, the smaller the investor's stake in the enterprise, the more likely it is that the investor would submit a poor project.

This proposition essentially follows from Schaffer's (1989) analysis. If the government is more paternalistic then the investor is more likely to launch a poor project

the smaller is the investor's share of the initial investment. A smaller share simply means that the investor has less to lose from launching the project.

The analysis of the government's behaviour requires a clarification of its overall objective. In line with Kornai's view, the basic soft budget constraint model can incorporate a certain level of paternalism by assuming that the government seeks to maximize the sum total of the players' payoffs. In the present setting, it is assumed that the government maximizes the non-financial social surplus and takes into account the funding of the project only to the extent of its own involvement. This is compatible with Boycko, Shleifer and Vishny's (1994) assumption that the government might find it costly to divert public money toward its pet projects because this is transparent and is in direct competition with other claims on the state budget. Assuming that the government is interested solely in its own payoffs would not change the results qualitatively. This scenario is presented below in this section.

The paternalistic government's ex post criterion for financing, i.e. the criterion for refinancing, is

$$(4.2) \quad P_G + P_I - (1 - b) > L_G + L_I.$$

On the other hand, the ex ante criterion for liquidation is

$$(4.3) \quad 2(1 - b) > P_G + P_I.$$

Inequality (4.3) means that the project is inefficient and the government would not have financed it in the first place, had it known that the project was poor. Whenever the two inequalities are simultaneously satisfied, there is a temporal inconsistency in the government's objective function and the enterprise's budget constraint is soft.

To see how b affects the two criteria, inequalities (4.2) and (4.3) can be rearranged to obtain

$$(4.4) \quad L_G + L_I - P_I + (1-b) < P_G < 2(1-b) - P_I.$$

As b increases, the right-hand side of this expression falls by a magnitude of 2, while the left-hand side falls by a magnitude of I , thereby narrowing the range of parameter values for which the two criteria for financing are simultaneously satisfied. By the same token, as b falls, the left-hand side of the expression increases by a magnitude of I , while at the same time the right-hand side increases by a magnitude of 2, thereby expanding the range of parameter values such that the two criteria are simultaneously met.

Furthermore, P_I , the investor's payoff from a refinanced poor project, enters in both the upper and the lower boundaries of P_G with negative sign and therefore has no effect on the range of values for which the budget softness is affected. By the same token an increase in either L_G or L_I , the liquidation payoffs, narrows the range of other values for which the budget becomes softer.

Given the information asymmetry at the outset of the interaction, the government would participate in a project whenever

$$(4.5) \quad a[\Pi_G + \Pi_I - (1-b)] + (1-a)[P_G + P_I - 2(1-b)] > 0.$$

Inequality (4.5) sets an upper threshold on a , the probability that the project is good, above which the uninformed government would participate in any project the investor submits. Denote this threshold by a^*

$$(4.6) \quad a^* = \frac{2(1-b) - P_G - P_I}{\Pi_G + \Pi_I - P_G - P_I + (1-b)}.$$

Expression (4.6) increases in b whenever $2(\Pi_G + \Pi_I) > P_G + P_I$, which is always the case.

Thus the second result of this analysis can be stated as follows.

Result 2.2

*As the investor's stake **increases**, and therefore the government's stake decreases, the threshold probability of the project being good, above which the uninformed government would fund a project, **decreases**. In other words, the smaller the investor's fraction of investment, the weaker the uninformed government's incentive to participate in a project.*

It is straightforward to show three further results derived from expression (4.6).

Result 2.1

The threshold probability that the project is good above which the uninformed government would fund any project is increasing in P_G and P_I , whenever $\Pi_G - (1-b) > \Pi_I$.

Result 2.2

The threshold probability that the project is good above which the uninformed government would fund any project is increasing in Π_G , whenever $2(1-b) > P_G + P_I$ and is decreasing otherwise.

Result 2.3

The threshold probability that the project is good above which the uninformed government would fund any project is decreasing in Π_b , whenever $2(1-b) > P_G + P_I$ and is increasing otherwise.

Finally, if $a > a^*$ and $L_G + L_I - (1-b) < 0$, the investor submits poor projects and the government maintains its involvement even after finding out that the project is inefficient. The second inequality is more likely to be satisfied for smaller b .

Importantly, these results do not depend qualitatively on the paternalistic character of the government. Indeed, suppose the government maximize its own payoff solely. Then the non-paternalistic government's ex post and ex ante criteria for refinancing and liquidation become $P_G - (1-b) > L_G$ and $2(1-b) > P_G$, respectively. These two inequalities can be satisfied simultaneously again and the enterprise would still enjoy a soft budget constraint. The threshold probability of a good project above which a non-paternalistic government would be willing to participate, a^{**} , becomes

$$(4.7) \quad a^{**} = \frac{2(1-b) - P_G}{\Pi_G - P_G + (1-b)}$$

The threshold a^{**} increases in P_G whenever $\Pi_G > 1-b$ holds, and is always decreasing in Π_G , whenever $1-b < \frac{P_G}{2}$ is true.

A simple numerical example of the calculations supporting the reasoning for the case of non-paternalistic government goes as follows. Assume that the government's payoff from a good project is 2, while its payoffs from a completed bad project and from liquidation are 1.5 and 0, respectively. Consider first the case when the government

covers 100% of the ex ante and ex post investments. The bad project is inefficient ex ante because $1.5 - 2 = -0.5 < 0$, but is efficient ex post, that is after the initial investment of I becomes a sunk cost, because $1.5 - 1 = 0.5 > 0$. The uninformed government would participate in the project whenever $a(2 - 1) + (1 - a)(1.5 - 2) > 0$, which yields a threshold $a > 0.33$. Consider now a situation where a fraction 0.2 of the investment is covered by the private investor. A bad project is still inefficient ex ante, because $1.5 - 1.6 = -0.1 < 0$, and efficient ex post, because $1.5 - 0.8 = 0.7 > 0$. However, now the uninformed government would participate in a project whenever $a(2 - 0.8) + (1 - a)(1.5 - 1.6) > 0$, which yields a threshold $a > 0.0769$, therefore it becomes more likely that the enterprise is afforded soft budget.

It is, of course, rather implausible to assume that a stake implies involvement at the investment stage only. The next step therefore is to consider another extreme scenario in which a retained stake affects the players' final payoffs only, while the government remains fully committed to covering the investment outlay. In this case, a non-paternalistic uninformed government would fund a project whenever $a[(1 - b)\Pi_G - 1] + (1 - a)[(1 - b)P_G - 2] > 0$. This is equivalent to

$$(4.8) \quad a > \frac{2 - (1 - b)P_G}{(1 - b)(\Pi_G - P_G) + 1}.$$

The right-hand side of expression (4.8) increases in b whenever $3P_G > 2\Pi_G$. This is a natural result – as the government's payoff is falling regardless of whether the project is good or bad, it would be less willing to participate in any project. In other words, it takes a larger probability that the project is good to persuade the government to take part.

Referring to the numerical example introduced above, note that the condition for the threshold to increase in b is satisfied because $3 \cdot 1.5 > 2 \cdot 2$. Thus it should be the case that as b decreases in this setting, the threshold should also decrease. Indeed, for $b = 0.2$, the government would participate in a project whenever $a \cdot 0.8 \cdot (2 - 1) + (1 - a) \cdot (0.8 \cdot 1.5 - 2) > 0$, which implies that $a > 0.5$. This threshold is larger than 0.33 , which was the threshold for government participation when $b = 0$.

It is obvious that if a stake implies a proportional fraction in both the final payoff and the investment and the government is non-paternalistic, changes in the stake does not affect the government's participation threshold. In this case the participation threshold must satisfy the inequality $a(1 - b)(\Pi_G - 1) + (1 - a)(1 - b)(P_G - 2) > 0$ or, equivalently,

$$(4.9) \quad a > \frac{2 - P_G}{\Pi_G - P_G + 1}.$$

The stake b does not appear in this expression.

To obtain more interesting results within this setting, consider the case of paternalistic government. The threshold would now be

$$(4.10) \quad a > \frac{(1 - b)(2 - P_G) - \Pi_I}{(1 - b)(\Pi_G - P_G + 1)}.$$

The right-hand side of expression (4.10) is positive for $(1 - b)(2 - P_G) > \Pi_I$, and in this case it is clearly decreasing in Π_I and in Π_G .

Consider next the case of paternalistic government that covers the whole investment but whose final payoff is adjusted according to its stake $(1 - b)$. The participation condition now becomes

$$(4.11) \quad a > \frac{2 + b(P_G - \Pi_I) - P_G}{\Pi_G + b(P_G - \Pi_G) + 1 - P_G}$$

In this case, the condition that ensures that the right-hand side of the last expression is increasing in b is more complicated and looks as follows $P_G \Pi_I + 2\Pi_G > \Pi_G \Pi_I + 2P_G$. As the right-hand side of this expression involves the product of Π_G and P_I , while the right-hand side does not, the inequality is more likely to be satisfied the larger these two payoffs become.

As a final extension, consider the case when the government's final payoff varies proportionally with its stake, but the government's investment share is affected in a non-linear or non-proportional manner. Such an assumption is consistent with the view that politicians' marginal benefit from an extra monetary unit spent on subsidies might be different from the marginal benefit of an extra monetary unit in the treasury. As Boycko Shleifer and Vishny (1996) argue, the government might face resistance when spending the treasury's money on its pet projects. The technical question pursued here is what shape the function describing the government's payoff associated with diverting budget funds to provide soft budgets should have, to ensure that a larger government share implies softer budget. Denote this function by $t(b)$. Thus, an amount of money b reduces the government's final payoff by a fraction of b , but it also reduces the government's payoff from its participation in the investment by $t(b)$, rather than by b . Assume further that the government is non-paternalistic. The familiar condition ensuring the government's participation becomes

$$a\{(1-b)\Pi_G - [1-t(b)]\} + (1-a)\{(1-b)P_G - 2(1-t(b))\} > 0 \text{ or, equivalently,}$$

$$(4.12) \quad a > \frac{2[1-t(b)]-(1-b)P_G}{(1-b)(\Pi_G-P_G)+[1-t(b)]}.$$

The right-hand side of this inequality increases in b whenever $\frac{1-t(b)}{1-b} > \frac{\partial t(b)}{\partial b}$. In other words any function $t(b)$ satisfying this last inequality for b between zero and one ensures that a smaller b softens the budget. Clearly this function should be non-increasing, i.e. the government's marginal cost of extracting a monetary unit from the state budget should be higher than the government's marginal cost from a monetary unit lost in the provision of soft budget for the enterprise.

The overall welfare effect of the soft budget constraint phenomenon, however, is ambiguous. As Dewatripont and Maskin hasten to add a mechanism that would harden the budget (the de-centralization of credit in their model) might prevent the implementation of profitable projects that last long, thereby encouraging too many short-term projects. They show that in game theoretic terms this amounts to a coordination problem, which encourages either a large number of small banks and entrepreneurs pursuing short-term projects or a small number of large banks, which can sustain long-term financing and hence encourage entrepreneurs to launch long-term projects.

Slightly diverging from the key argument developed in the present section, it would be interesting to find out how Dewatripont and Maskin's (1995) argument that the de-centralization of credit effectively hardens the enterprise's budget fares in the case of privatization. The authors model de-centralization, quite simply, by introducing two funding centers, rather than one, and by assuming that none of the centres is able to sustain a poor (slow) project single-handedly. One of the funding centers injects funds in

the first period, but if the project turns out to be poor, the enterprise, or rather the first funding center again, should turn to the second center for additional funding.

The second center, however, has informational disadvantage regarding the project vis-à-vis the first center, because the latter is assumed to have made investments in figuring out the quality of the project. Because of this, the second center would require an extra return on its investment. In anticipation of this extra burden, the first centre would invest in monitoring less than the optimal level under centralization, and would be therefore less likely to finance the project ex ante, thereby effectively hardening the budget.

This scenario seems pertinent to the case of privatization, as conceived in the present chapter, whenever it is the case that the poor project lasts for more than one electoral period and thus might encounter two different governments. The main difference is that unlike other funding centers, such as banks, governments, even when profit maximizing, would typically lose interest in their investment projects when they leave office. Yet the prospect of being out of office when the benefits of a poor project materialize would affect the monitoring effort of the government due to a reason similar to the one Dewatripont and Maskin identify.

Assume for simplicity that the first government is a right-wing, non-paternalistic, profit-maximizer. The nature of the second government would not matter in this setting because we only care about the decision of the first government and how this decision is affected by the chance of losing the next election. Suppose also that a refinanced poor project yields benefit P_G for the government, but only with probability e . In line with the assumptions of Dewatripont and Maskin, this probability is taken as a measure of the

government's effort in 'monitoring' the project. Thus with probability $(1 - e)$, the poor project yields zero benefit.

$F(e)$ is an increasing function with a positive second derivative measuring the government's cost of monitoring effort. Specifically, $\frac{\partial F}{\partial e} > 0$, $\frac{\partial^2 F}{\partial e \partial e} > 0$, $F(0) = \frac{\partial F(0)}{\partial e} = 0$, and $\frac{\partial F(1)}{\partial e} = \infty$. If the government expects to stay in power until the project's completion, then it would choose an effort level e^* that maximizes the function $eP_G - F(e)$. The optimal effort level e^* should satisfy the first order condition

$$(4.13) \quad P_G = \frac{\partial F(e^*)}{\partial e}.$$

Hence the benefit of financing the project, ignoring the investment $(1 - b)$, is

$$(4.14) \quad C = e^* P_G - F(e^*).$$

If the government expects to win the next election only with probability $w < 1$, however, then it would choose an effort level e^{**} that maximizes the function $ewP_G - F(e)$. The optimal effort level e^{**} then should satisfy the first order condition

$$(4.15) \quad P_G = \frac{\partial F(e^{**})}{\partial e} \frac{1}{w}.$$

Since $F(\cdot)$ is an increasing convex function, it follows that $e^{**} < e^*$. The benefit of refinancing the project, ignoring the investment again, is

$$(4.16) \quad D = e^{**} P_G - F(e^{**}).$$

Again due to the shape of $F(\cdot)$, D smaller than C , hence refinancing is less likely the larger is the probability that the incumbent government loses the next election and thus fails to absorb the benefits from the project.

4.4 A Discussion of the Workers' Commitment Problem

As explained in chapter one, political bargains are notoriously difficult to enforce (Dixit 1996 and North 1990) because of at least two reasons: (i) the actors' capability of grasping the essence of their environment is worse in the realm of politics than in economic transactions due to the inherent ambiguity of the terms of the 'deal' and the fact that most people are not particularly interested in politics. Political platforms, for example, deal with problems concerning whole countries, rather than just firms and their interactions with supplies, consumers and competitors. Moreover, it is difficult to discern the instances when politicians' speeches make sense in terms of budget resources or other constraints, and then promises are likely to be fulfilled. Politicians' promises are by necessity vague because of the enormous complexity of the issues at hand. (ii) There is no mechanism of third party enforcement, as one of the players is the government, i.e. the ultimate enforcer itself.

In the model of this chapter, for example, partial privatization effectively commits the present and future governments to the deal's terms only to the extent that it is politically unfeasible for the governments to overhaul the whole privatization program. Yet, to the extent that governments expect to stay in office for more than one term, they might seek to build a reputation of restraining from sudden and unexpected policy reversals or outright expropriations in order to encourage entrepreneurship. Using

Olson's well-known criminal metaphor (Olson 2000, pp. 4-5), while a 'roving bandit' has a small stake in the society's economic prosperity because of his short-term perspective, a 'stationary bandit' with a 'well-defined turf' has an incentive to ensure the prosperity of those subjected to his power in order to extort more sizeable profits. However, even if for reputation-building reasons the government would certainly restrain from policy reversals and/or extortion, the commitment scenario proposed here might be inefficient because the government might actually prefer to 'compensate' the workers not by the 'self-enforced' commitment of partial privatization, but by paying them a lump-sum one-time redundancy compensation packages. In particular, providing an enterprise with soft budget might set an unwelcome precedent, which would distort the expectations of managers of other enterprise and encourage them to launch inefficient projects too. There are a number of examples of clearly inefficient but nevertheless long-lasting policies, most notably the use of protective tariffs and quotas.

Dixit and Londregan (1995) address the question of why such inefficiencies persist. Their answer is that voters that tend to benefit from the inefficient arrangement cannot credibly pledge to cast their votes for the government, which promises to grant the lump-sum compensation transfer in question. This inability to make a credible promise renders the whole deal ineffective. Yet there are mechanisms for overcoming this commitment problem. As Schelling clarifies '[t]rust is often achieved simply by the continuity of the relation between parties and the recognition by each that what he might gain by cheating in a given instance is outweighed by the value of the tradition of trust that makes possible a long sequence of future agreements. *By the same token, "trust"*

may be achieved for a single discontinuous instance, if it can be divided into a succession of increments.' (Schelling 1960, pp. 134-135, emphasis added)

In the commitment scenario proposed in the present chapter, the government might prefer the soft budget constraint mechanism to the lump sum transfer precisely because it has to ensure that the workers live up to their part of the deal, i.e. vote in favor of the ruling parties. Specifically, workers are so committed for at least two reasons.

Firstly, in the case of paternalistic government, funding can be provided in small increments that are conditional on the political support of the constituency in question. An obvious problem is that elections, as a rule, take place at a predetermined time schedule, say, every four years. Consider, however, a party that belongs to the ruling coalition, has a small well-defined constituency and has intimate knowledge of that constituency. Because of its position, such a party can effectively monitor the 'mood' of its voters, i.e. whether they are likely to vote as expected in the next election, and respond accordingly, i.e. continue supporting the enterprise in question or not. Opinion polls, for example, could provide reliable information about the popularity of political parties.

Secondly, whenever it is a left-wing, paternalistic government that pushes through the privatization program, workers would be more likely to support the incumbent government, rather than a right-wing, opposition, non-paternalistic party.³² It is perfectly reasonable to assume that a left-leaning government would pursue privatization, although it is traditionally perceived as a right-wing reform. Indeed empirical evidence suggests that interventionist populist governments often implement 'unexpected' reforms, such as trade liberalization (Rodrik 1993). Cukierman and Tommasi (1998) provide a particularly insightful answer: Suppose the government is well informed about the exact relation

³² This point was suggested by Anil Duman.

between policy choices and outcomes while voters, who care about outcomes, are relatively under-informed. Then a government that is known to be left-wing can claim that a right-wing policy is better suited to achieve the outcome preferred by a majority of voters and implement such a policy, without raising the suspicion that its policy stance is affected by its ideological color. Cukierman and Tommasi (1998) develop a cheap-talk game theoretic model to formalize this only-Nixon-could-go-to-China type of intuition and to show that policy ‘reversals’ of this sort should be infrequent and relatively ‘large.’

4.5 Conclusion

This chapter showed that, under certain conditions, partial privatization could credibly ensure that workers would remain employed at the divested enterprise ex post. The argument relied on the idea that the partial private owner of an enterprise in which the state has remained passively involved, i.e. has relinquished decision making powers, is more likely to face a soft budget constraint and thereby pursue more projects than otherwise, which in turn raises employment. This commitment is credible because it exploits the government’s economic incentives, in addition to its paternalistic stance. Thus even if a paternalistic government is replaced by a government that seeks efficiency solely, the latter is unable to harden the investor’s constraint and thus lower employment.

It is perhaps interesting to note that models dealing with time inconsistent behaviour, which essentially leads to the soft budget constraint phenomenon presented in this paper, tend to see it as a problem. For example, Kydland and Prescott (1977) famously argued that policymakers might have incentives to ex-post change a policy plan that was optimal ex ante. In turn, as forward-looking actors recognise this they might

change their behaviour in a way that yields an outcome that is worse than the outcome that would have prevailed had policymakers' ex-post incentives did not call for change. Thus, following Barro and Gordon (1983) central banks would be advised to follow clear rules rather than have discretion in shaping their monetary policies. As surprise inflation might yield benefits, e.g. boost employment, economic agents would recognise that the central bank will try to 'surprise' them and will therefore adjust their behavior in anticipation of this, which leads to a worse outcome than the one associated with the central bank's optimal ex-ante plan, i.e. zero inflation. (see however the critique of Dixit 1996)

In the context of the present chapter, the inability to commit, i.e. to harden the firm's budget, rather solves a problem. The government is able to commit itself ex-ante by partially privatizing, because it lacks commitment ex-post to restrain from bailing out the financially troubled enterprise. Furthermore, partial privatization is more likely to ensure that workers fulfil their part of the deal, i.e. vote for the incumbent party in the next election, than other policy instruments, such as lump-sum compensations paid to laid off workers, despite the fact that these alternative arrangements might well be more efficient.

Chapter 5 – Rent Seeking and Privatization

5.1 Introduction

This chapter presents an attempt to analyze the role rent seeking activities play in privatization. Rent seeking was among the key political constraints Gerard Roland listed as binding in the process of privatization (Roland 2000, pp. 237-238). Yet, as he claimed in the same book, there were no systematic attempts to incorporate rent seeking activities into the formal models dealing with economic transition.

Rather than developing a model from scratch, this chapter reviews and occasionally extends some of the key results derived from a standard rent seeking model in order to develop the argument that wasteful influence seeking activities may hinder privatization. The goal is to clarify the exact nature of the interaction that might pose an obstacle.

Section 5.2 offers a review of the literature on influence seeking and rent seeking activities, in general, and an evaluation of Frydman and Rapaczynski's (1994) early argument of how rent seeking might affect privatization and its aftermath, in particular. This is followed by section 5.3, which is a review of several extensions of Tullock's (1974) seminal rent seeking model. Section 5.4 elaborates on what this model implies for the government's decision to privatize. Section 5.5 offers some concluding remarks.

5.2 The Theory of Rent Seeking

Tullock (1967) is allegedly the first paper to identify and analyze the phenomenon of rent seeking. The term ‘rent seeking’, however, was brought to prominence by Krueger (1974). Tullock and Krueger focused on rents resulting from the creation of monopoly positions and the introduction of various tariffs, quotas, licenses and other types of governmental regulations that make it worthwhile for economic actors to devote resources and efforts in order to acquire them.

A number of extensions of Tullock’s and Krueger’s insights appeared subsequently, most often applied to the problems addressed by international trade economists. Bhagwati (1982), for example, introduced the notion of ‘Directly Unproductive, Profit-seeking (DUP) Activities’. By this general term, Bhagwati denotes any kind of economically relevant activity that does not enter directly or indirectly into anybody’s utility or production function. In his account the activities described by Tullock and Krueger form a proper subset of the DUP activities. Bhagwati’s analysis is welfare oriented and one of his main insights was that certain DUP activities are welfare enhancing. Such welfare improving outcomes may result when the economic system is already distorted by governmental intervention, and essentially functions in a second best mode (Bhagwati 1982, p. 992).

The nature of rent seeking was also addressed by James Buchanan (1980). Buchanan argued that rent seeking activities form a specific subset of profit seeking activities. Just like ordinary profit seeking, rent seeking is driven by people’s self interest and might even be economically efficient when it takes place in a well-functioning market system. This implies that it is the specific character of the institutional structure of

the political economy that may convert profit seeking into socially wasteful and thus normatively undesirable set of activities. Importantly, Buchanan suggests that at the level of the individual actor, economically beneficial profit seeking and socially wasteful rent seeking are essentially the same thing. Both waste and benefit appear as unintended aggregate consequences. To repeat an expression that perhaps already sounds trivial, ‘the rules of the game are crucial.’ Baumol (1990), among others, reminds us that ‘[t]he rules of the game that specify the relative payoffs to different entrepreneurial activities play a key role in determining whether entrepreneurship will be directed toward productive or unproductive activities’ and that ‘[t]his can significantly affect the vigor of the economy’s productivity growth’ (Baumol 1990, p. 918).

The first formalization of rent seeking was provided by Tullock (1980). He describes the following game

...we assume two parties who are participating in a lottery under somewhat unusual rules. Each is permitted to buy as many lottery tickets as he wishes at one dollar each, the lottery tickets are put in a drum, one is pulled out, and whoever owns that ticket wins the prize.

(Tullock 1980)

If players A and B are risk-neutral and contest a prize of say, \$100, then their payoff functions can be represented as $\$100 \frac{a}{a+b} - a$ and $\$100 \frac{b}{a+b} - b$, where a and b are the lottery tickets that A and B , respectively, choose to purchase. This game has a unique Nash equilibrium with positive outlays, in which each player purchases 25 tickets. Thus Tullock concludes that just a fraction of the ‘prize’ would be wasted in rent

seeking.³³ More generally the total outlays depend on the structure of the contest. Tullock's result, or rather his convenient formulation, led to a large literature examining this particular question (see, for example, Garfinkel and Skaperdas (2006) for an extensive review of this literature).

It is not quite obvious how rent seeking could hinder privatization. Indeed privatization can be seen as a process of rent creation, especially in transition countries, which would inevitably give incentives to various stakeholders to attempt to affect its results. The basic rent seeking model of Tullock (1980), however, is static in that its outcome emerges instantaneously. Even if the prospect of privatization in itself creates incentives for the potential private owners to influence various parts of the privatization deal or even the selection of the owner, the model would imply that the privatization in question would take place immediately.

Nevertheless, the literature suggests how rent seeking could prevent privatization.³⁴ For example, Gerard Roland claims

Rent seeking plays an important role, especially when governments are weak and do not have the necessary powers to control the setting of the political agenda. Privatization involves dividing the spoils of the communist state. The transfer of the bulk of government wealth to private hands is a *unique historical opportunity for rent seeking*. Accordingly there is a lot of scope for large-scale rent-seeking activities in the context of privatization in Eastern Europe.

(Roland 2000, p. 238, emphasis added)

and also,

³³ Specifically, Tullock (1980) sought to challenge the view that all surplus associated with a monopoly position would be wasted, from social point of view, through rent seeking. Posner (1975) proposes a formulation in which contestants devote total resources exactly equal to the amount of the rent.

³⁴ Still the argument is quite simplistic because it provides no mechanism explaining *delays* in the privatization process.

At the beginning of transition, the view was expressed that the most important thing was to get the state out of the economy. Fast privatization was viewed as the instrument to achieve this objective. If we take the rent-seeking perspective seriously, we know that privatization does not prevent lobbies from intervening and constantly trying to influence decisions of a weak government both before and after privatization.

(Roland 2000, p. 238)

From this account it follows that one important characteristic of rent seeking is that it takes place *after* privatization too. In other words the privatizing government might fail to de-politicize the enterprises's decision-making process and remain subjected to continued pressure for subsidies.

Frydman and Rapaczynski (1994) go even further and argue that the specific positions of certain enterprises make them especially valuable in terms of exercising political pressure to get subsidies from the state in spite of the fact that the ownership is nominally transferred into private hands. Even if such enterprises are not economically viable and may continuously generate losses, the fact that their closure would be socially painful and thus politically unthinkable generates important political value for those who happen to own them or are in some other way economically interested in their existence.

In effect, as long as the capital stock contains too much that is economically worthless, so that its improvement involves serious social costs, the government is always subject to being held up for ransom by the holders of economically worthless assets. *Only when the winnowing out of the bad assets is a marginal, rather than the normal, economic problem, can the political system effectively resist pressures for large-scale redistribution.* (Frydman and Rapaczynski 1994, p. 193, emphasis in the original)

Given the arguments of Roland (2000) and Frydman and Rapaczynski (1994), the present chapter submits that to the extent that the government is forward looking, it should be reluctant to privatize enterprises that would strengthen the rent seeking abilities of the enterprise's future private owner(s). Rent seeking in this setting does not directly obstruct the very act of privatization as Roland's claim might imply, rather in anticipation of future rent seeking the government might refuse to privatize. In the soft budget constraint setting presented in chapter four, for example, socially wasteful rent seeking expenses might reduce the government's payoff from having a private investor involved in an enterprise that pursues poor project. This would in turn narrow down the range of parameters for which the budget is soft and effectively make privatization unacceptable for investors in the first place.

A highly abstract world exhibiting the above features looks as follows. There is a government that is concerned about the total amount of resources devoted to rent seeking, but that also cares about employment. There is also a state-owned enterprise that operates in a market inhabited by private enterprises. The market's features are such that the enterprises generate some positive profits from purely market activities. The government considers whether to privatize the state-owned enterprise in a bid to boost its performance, but at the same time anticipates that the new owner might prefer to shift focus from pursuing market generated profits to wasteful rent seeking. Such a switch is assumed to constitute an advantage vis-à-vis the other enterprises in the market, which in turn would force these other enterprises to devote some resources to rent seeking too. All enterprises operating in this market are thus 'forced' to participate in a contest to win a 'prize' consisting of subsidies granted by the government.

Section (5.3) below considers the following three factors that might affect the total amount of resources devoted to rent seeking.

i. How vulnerable the government is to rent seeking pressure? For example the newly privatized enterprise might employ a large number of workers, which would render the government more vulnerable. Thus a monetary unit spent by the owner of the enterprise in question would have a greater impact on the government's decision, relative to a monetary unit spent by the owner of an enterprise that employs fewer workers or is less politically important for some other reason.

ii. How valuable the 'prize' is to different rent seekers? This is meant to capture the idea that some enterprises could be relatively more efficient and thus consider the 'prize' awarded in the rent seeking contest relatively less valuable. In the period that immediately follows the privatization of an enterprise, it is natural to assume that other enterprises, which have been private for a longer time, would be operationally more efficient and therefore attach lower value to the prize.

iii. The nature of the rent seeking interaction would also matter. The models reviewed in the next section show how differences in the strategic environments might affect the total amount of rent seeking expenses. Specifically, the section examines two protocols of rent seeking – Cournot and Stackelberg. In the Stackelberg protocol, one of the enterprises is able to commit itself to a certain amount of rent seeking resources in advance. The second enterprise observes this amount and conditions its own choice upon it. Dixit (1987) studies a rent seeking game with such pre-commitment and argues that such a pre-commitment can be made either directly or 'indirectly through some other variable that would influence the *ex post* choice of effort' (p. 891). One can imagine that

in present context the potential future owner pledges to maintain a certain level of employment and signs a contract to that effect, but upon privatization finds out that the market conditions do not warrant the promised number of workers. In order to fulfill the privatization contract, the investor is forced to resort to rent seeking to obtain subsidies from the government. Thus the contract effectively pre-commits the enterprise to exert a certain level of pressure.

The models in section (5.3) are not specifically tailored to study privatization; in fact they have been developed to study themes ranging from wars (Garfinkel and Skaperdas 2006) to influence within firms (Milgrom and Roberts 1990). As the discussion below qualifies some of the results on rent seeking contests, it is interesting in its own right as well.

5.3 Rent Seeking Contests: A Review of Results

This section offers a selective review of the literature on rent seeking contests. The rent seeking contest introduced by Tullock (1980) was followed by a welter of extensions. The overview presented in the present section considers two players and focuses on two protocols of rent seeking, Cournot versus Stackelberg, and on asymmetries between the contestants with respect to the information available to contestants, asymmetries regarding the contestants' effectiveness and differences in the valuations that contestants attach to the prize they seek to obtain. The question to be pursued is how changes in the informational and structural features of the interaction affect the total amount of resources devoted to rent seeking. The assumption that there are only two contestants involved simplifies the algebra without affecting the qualitative aspects of the results.

The basic rent seeking model

The notation used throughout the model is the following.

V – rent to be divided

x_i – the expenditure incurred by player i , $i=1,2$ (measured in the same units as V)

C – rent seeking cost measured as the sum of the players' expenditures

U_i – the net payoff to player i , $i=1,2$

S_i – shares of the rent that accrues to the respective player.

More generally, S is called contest success function. It measures the relative influence of the respective contestant. S may denote either the probability of winning the rent or the portion of rent that accrues to the respective contestant. Define S as follows

$$(5.1) \quad S_i = \frac{x_i}{x_1 + x_2}$$

Expression (5.1) is a version of Tullock's (1980) formulation $S_i = \frac{x_i^r}{x_1^r + x_2^r}$, in which the parameter r measures the marginal cost of influencing S . As Tullock noticed, in the Cournot-Nash play of the game, for a large enough r the contestants' rent seeking expenditures might well exceed the value of the prize V . A number of papers have attempted to resolve this 'paradox.' Recently, models of endogenous determination of the rent seeking protocol show that contestants would, in general, prefer to move sequentially, in a certain order, which would rein in their expenditures (Leininger 1993). These models, however, remain beyond the scope of this review.

Skaperdas (1996) uses an axiomatic approach to defining appropriate contest success functions. Expression (5.1) belongs to the set of functions that satisfy the Skaperdas's (1996) axioms – it has the properties of a probability function; if a contestant expends a positive amount of resources then her probability of winning the prize is also positive; each contestant's probability of winning increases in her own expenditures and decreases in the expenditures of others; and each contestant's probability of winning does not depend on her identity or the identity of others.

Given (5.1), the net payoff to contestant i is given by

$$(5.2) \quad U_i(x_1, x_2) = V \frac{x_i}{x_1 + x_2} - x_i$$

and the best-response functions of the two contestant are given by

$$(5.3) \quad x_1(x_2) = \frac{\sqrt{x_2}}{\sqrt{V} - \sqrt{x_2}} \quad (BR1)$$

$$(5.4) \quad x_2(x_1) = \sqrt{x_1}(\sqrt{V} - \sqrt{x_1}) \quad (BR2)$$

In the Cournot protocol (i.e. simultaneous moves) the Nash equilibrium with positive outlays is given by

$$(5.5) \quad x_1^c = x_2^c = \frac{V}{4}$$

with total rent seeking expenditures

$$(5.6) \quad C^c = x_1^c + x_2^c = \frac{V}{2}$$

where the superscript c stands for Cournot.

Consider next the Stackelberg protocol in which contestant 1 moves first and contestant 2, having observed contestant 1's choice, moves second. The game is analyzed

using backward induction. Anticipating contestant 2's response, given by (BR2), contestant 1's payoff function becomes

$$(5.7) \quad U_1 = (x_1) = \sqrt{x_1} (\sqrt{V} - \sqrt{x_1})$$

This is maximized at

$$(5.8) \quad x_1^s = \frac{V}{4}$$

where the superscript s stands for Stackelberg. From (BR2), it follows that

$$(5.9) \quad x_2^s = \frac{V}{4}$$

The total rent seeking expenditures under Stackelberg are given by

$$(5.10) \quad C^s = x_1^s + x_2^s = \frac{V}{2}$$

Hence, the equilibrium rent seeking expenditures, as well as the total expenditures in the basic rent seeking model, are the same regardless of the protocol of interaction.

$$x_1^c = x_2^c = x_1^s = x_2^s = \frac{V}{4}$$

and

$$C^c = x_1^c + x_2^c = C^s = x_1^s + x_2^s = \frac{V}{2}$$

The equilibrium payoffs are also the same

$$(5.11) \quad U_1^c = U_2^c = U_1^s + U_2^s = \frac{V}{4}.$$

Rent seeking when players' effectiveness differ

Kohli (1994), Leininger (1993), among others, employ a particularly convenient way to model rent seeking contests when the contestants differ in their relative effectiveness. In these models, the contestants' levels of effectiveness is denoted by e_i ($i = 1, 2$) and their contest success functions become

$$(5.12) \quad S_i = \frac{e_i x_i}{e_1 x_1 + e_2 x_2}$$

Setting $a = \frac{e_1}{e_2}$ transforms these functions into

$$(5.13) \quad S_1 = \frac{ax_1}{ax_1 + x_2}$$

$$(5.14) \quad S_2 = \frac{x_2}{ax_1 + x_2}$$

where a now measures contestant 1's relative effectiveness.

The new payoff functions become

$$(5.15) \quad U_1(x_1, x_2) = V \frac{ax_1}{ax_1 + x_2} - x_1$$

$$(5.16) \quad U_2(x_1, x_2) = V \frac{x_2}{ax_1 + x_2} - x_2$$

and respective reaction functions are given by

$$(5.17) \quad x_1(x_2) = \frac{\sqrt{x_2}(\sqrt{Va} - \sqrt{x_2})}{a} \quad (BRE1)$$

$$(5.18) \quad x_2(x_1) = \sqrt{x_1}(\sqrt{Va} - a\sqrt{x_1}) \quad (BRE2)$$

Under Cournot, the Nash equilibrium rent seeking expenditures are equal and are given by

$$(5.19) \quad x_1^c = x_2^c = \frac{aV}{(1+a)^2}$$

while the total rent seeking costs are given by

$$(5.20) \quad C^{ca} x_1^c + x_2^c = \frac{2aV}{(1+a)^2}.$$

C^{ca} reaches its maximum at $a = 1$, which yields

Result 5.1

Under Cournot protocol, i.e. when the contestants move simultaneously, the total amount of rent seeking expenditures reaches its maximum when the contestants are equally effective.

Under Stackelberg, assume that contestant 1 moves first. Since a measures relative effectiveness, this assumption does not lead to any loss of generality. Given contestant 2's best response function (*BRE2*), contestant 1 maximizes

$$(5.21) \quad U_2(x_1) = \sqrt{x_1}(\sqrt{xV} - \sqrt{x_1})$$

Contestant 1's equilibrium expenditures are $x_1^s = \frac{aV}{4}$, and contestant 2's equilibrium

expenditures are $x_2^s = \frac{aV(2-a)}{4}$. Contestant 2's expenditure are positive if and only if

contestant 1 is not too effective, that is if $a < 2$.

Assuming that the last inequality holds, the total rent seeking expenditures under Stackelberg protocol are given by

$$(5.22) \quad C^{sa} = x_1^s + x_2^s = \frac{aV(3-a)}{4}.$$

C^{sa} reaches its maximum at $a = 3/2$. Hence

Result 5.2

Under Stackelberg protocol, the total amount of rent seeking expenditures is highest when the first mover is relatively more effective.

Finally, compare the total rent seeking expenditures under the two protocols by taking the difference between expressions (5.20) and (5.22).

$$(5.23) \quad C^{ca} - C^{sa} = \frac{aV \left\{ 2 - [(3-a)(1+a)^2] \right\}}{4(1+a^2)}$$

This expression is positive for $a < 1$, negative for $a > 1$ and zero for $a = 1$. Kohli (1994) summarizes these results as the Underdog Theorem.

Result 5.3 (Kohli's Underdog Theorem)

Under Stackelberg protocol, if the leader is more effective, $a > 1$, then she spends more on rent seeking than under Cournot protocol, i.e. $\frac{aV}{4} > \frac{V}{4}$. The follower, on the other hand, spends less under Stackelberg than under Cournot, $x_2^s < x_2^c$ for $1 < a < 2$. Furthermore, when the leader is more effective, the Stackelberg equilibrium is less efficient, as it involves a larger amount of total expenditures devoted to rent seeking.

Dixit (1987) obtained the same result. His analysis is more general and refers to any type of contest-like situation in which rivals expend efforts to win a prize. Dixit's interpretation of the result is that with two asymmetric contestants, the level of 'effort'

the ‘favorite’ would commit, assuming that she has the opportunity to make such a commitment, is larger than the effort committed in the Nash equilibrium with simultaneous moves. The opposite is true for the ‘underdog.’ Furthermore, Dixit extends the analysis by including more than two contestants and finds that the absence of a ‘favorite’ among the contestants would imply an over commitment by all contestants.

Rent seeking when contestants value the prize differently

This sub-section builds upon Kohli’s (1994) results by allowing the two contestants to attach different values to the prize. Rent seeking with different valuations was analyzed by Linster (1993). His model, however, did not account for differences in effectiveness. The purpose of the extension presented here is to study how the differences in valuations affect Kohli’s result. It is shown that the Underdog Theorem need not hold when valuations are too dissimilar.

Denote the valuation of contestant 1 by V_1 and the valuation of contestant 2 by V_2 .

The respective payoff functions now become

$$(5.24) \quad U_1(x_1, x_2) = V_1 \frac{ax_1}{ax_1 + x_2} - x_1$$

$$(5.25) \quad U_2(x_1, x_2) = V_2 \frac{x_2}{ax_1 + x_2} - x_2$$

The Cournot-Nash equilibrium outlays become

$$(5.26) \quad x_1^c = \frac{aV_2V_1^2}{(aV_1 + V_2)^2}$$

$$(5.27) \quad x_2^c = \frac{aV_1V_2^2}{(aV_1 + V_2)^2}$$

while the equilibrium payoffs are given by

$$(5.28) \quad U_1^c(x_1^c, x_2^c) = \left[1 - \frac{V_2}{aV_1 + V_2} \right] \frac{aV_1^2}{aV_1 + V_2}$$

$$(5.29) \quad U_2^c(x_1^c, x_2^c) = \left[1 - \frac{aV_1}{aV_1 + V_2} \right] \frac{V_2^2}{aV_1 + V_2}$$

The total rent seeking expenditures are given by

$$(5.30) \quad C^{cv} = x_1^c + x_2^c = \frac{aV_1V_2(V_1 + V_2)}{(aV_1 + V_2)^2}.$$

C^{cv} reaches its maximum at $a = \frac{V_2}{V_1}$. This represents the first modification of the results reported in the previous sub-section.

Result 5.4

Under Cournot protocol, when the contestants differ in terms of effectiveness and valuations, the total amount of rent seeking expenditures reaches its maximum when the contestants' relative effectiveness equals the ratio of their valuations.

Obviously when $V_2 = V_1$, the maximum is reached when $a = 1$. However, **Result 5.4** implies that in the Cournot-Nash setting, if one of the contestants attaches a higher value to the rent being contested then increasing the rent seeking effectiveness of the other contestant (the contestant with the lower valuation) tends to increase the total amount of rent seeking outlays.

Consider next the Stackelberg scenario. Assume again without loss of generality that contestant 1 moves first and contestant 2, having observed the previous choice,

moves second. The game is solved along the lines of backward induction again. Given the best-response function of contestant 2, contestant 1 maximizes

$$(5.31) \quad U_1(x_1) = V_2 \sqrt{x_1} (\sqrt{aV_2} - \sqrt{x_1})$$

The equilibrium expenditures are given by

$$(5.32) \quad x_1^s = \frac{aV_1^2}{4V_2}$$

$$(5.33) \quad x_2^s = \frac{2V_2 - aV_1}{2} \frac{aV_1}{2}$$

where $x_2^s > 0$ is for $a < \frac{2V_2}{V_1}$.

Provided that the inequality is satisfied, the total rent seeking expenditures become

$$(5.34) \quad C^{sv} = x_1^s + x_2^s = \left[1 + \frac{(1-a)V_1}{2V_2} \right] \frac{aV_1}{2}.$$

C^{sv} reaches its maximum at $a = \frac{1}{2} + \frac{V_2}{V_1}$. This modifies **Result 5.2** as follows

Result 5.5

Under Stackelberg protocol, when the contestants differ both in the value they attach to the rent being sought in their relative effectiveness, if the valuation of the follower is sufficiently smaller relative to the valuation of the leader, i.e. if $a < \frac{2V_2}{V_1}$, then the total rent seeking expenditures reach their maximal level at a point where the follower is more effective than the leader.

Essentially, **Result 5.5** suggests that with varying valuations and effectiveness, for a certain range of parameters, the result stated in the Underdog Theorem is reversed.

Rent seeking with asymmetric information regarding the value of the prize

The last extension of the basic rent seeking model considered in this section assumes that the two contestants attach the same value to the prize, but one of the contestants has superior information about that value. The most interesting scenario in this setting occurs when the contestants move sequentially, as this would have the informed contestant trying to signal her information to the uninformed contestant. In this case, the interaction has the structure of a signalling game.

Fu (2006), among others, analyzed such an extension and reported a result similar to the one obtained in this subsection, namely that the low value informed contestant would like to spend less on rent seeking in order to credibly prove that the prize's value is indeed low. Hence, in the context of dissipative contests (lobbying, corruption and other rent seeking contests), informational asymmetries are welfare enhancing in that they reduce the total amount of rent seeking expenditures. In the literature on industrial organization Gal-Or (1987) studies Cournot's duopoly model when one of the firms is better informed about demand. Tirole (1988, p. 450-452) provides an especially instructive presentation of Gal-Or's model and the analysis below follows Tirole's exposition.

It should be mentioned that the literature on contests in which the sequence of moves is determined endogenously show that when contestants differ in terms of the information available to them or in their rent seeking 'effectiveness', the timing of the

contest exhibits certain patterns (Leininger 1993, Morgan 2003 and Fu 2006). In particular, Fu (2006) arrived at the conclusion that in the case of informational asymmetries with regard to the value of the prize, the uninformed contestant would move first, while the present subsection assumes that uninformed contestant moves second. In his set up, however, the actual rent seeking contest is preceded by a simultaneous move game in which the contestants choose one out of three protocols of interaction: simultaneous Cournot type game, Stackelberg interaction with the informed player moving first or Stackelberg interaction with the informed player moving second. Moreover, during this first session, the informed contestant does not actually know the value of the prize. Both players know who the informed player is. Fu argues that his results explain why the political parties of incumbent US presidents tend to schedule their national presidential conventions after the conventions of the opposition parties. His analysis implies that incumbent presidents are better informed about the ‘value’ of the presidency, ‘the winner’s purse’ and therefore move second.

Although it is quite plausible to argue that the timing of moves in contests is not random, the assumption that the protocol of interaction is determined by the contestants themselves in a simultaneous move game *before* the actual play is certainly ad hoc. A more complete treatment of Fu’s model should investigate whether the contestants have incentives to reconsider the institution governing their interaction *after* the value of the prize becomes known to the informed player, and how additional factors, such as the contestants’ rent seeking effectiveness affect the timing of the game that determines the sequence of moves.

With these caveats in mind, the remainder of this subsection assumes that the informed contestant moves first in order to send a signal regarding the value of the prize.

Assume that the two contestants attach the same value to a prize, but this value can be of two types, V_L and V_H , such that $0 < V_L < V_H$. Contestant 1 learns the prize's type, which hereafter will be referred to as contestant 1's type, and chooses her rent seeking expenditures. Thereafter contestant 2 observes contestant 1's choice, but not her type, and chooses her rent seeking expenditures. This ends the game.

To find the sequential equilibria of this game, denote contestant 2's prior beliefs by $p(V_L) = q$ and $p(V_H) = 1 - q$. After observing contestant 1's move, contestant 2 updates her beliefs as follows $p^o(V_L | x_1) = \mu(x_1)$ and $p^o(V_H | x_1) = 1 - \mu(x_1)$ and maximizes her payoff function given these updated beliefs. Symbolically, contestant 2 maximizes the following expression

$$(5.35) \quad \left\{ \mu(x_1)V_L + [1 - \mu(x_1)]V_H \right\} \frac{x_2}{x_1 + x_2} - x_2$$

Hence her best response function is given by

$$(5.36) \quad BR(x_1) = x_2(x_1) = \sqrt{x_1} \left\{ \sqrt{\left\{ \mu(x_1)V_L + [1 - \mu(x_1)]V_H \right\}} - \sqrt{x_1} \right\}$$

Expression (5.36) is decreasing in $\mu(x_1)$, the belief that the prize is low, therefore, contestant 1 will try to convince contestant 2 that the prize is low in order to make contestant 2 devote less resources to rent seeking and thereby increase her (contestant 1's) chances of winning.

Using incentive compatibility reasoning, it is straightforward to show that in any separating equilibrium contestant 1 spends more resources on rent seeking when the prize

is high. Denote the optimal choices of the high and the low type by x_1^H and x_1^L , respectively. To ensure that these choices satisfy incentive compatibility, it must be the case that neither type has an incentive to select the equilibrium choice of the other type. In other words, the following two inequalities should be satisfied

$$(5.37) \quad V_L \frac{x_1^L}{x_1^L + BR(x_1^L)} - x_1^L \geq V_L \frac{x_1^H}{x_1^H + BR(x_1^H)} - x_1^H \quad (ICL)$$

$$(5.38) \quad V_H \frac{x_1^H}{x_1^H + BR(x_1^H)} - x_1^H \geq V_H \frac{x_1^L}{x_1^L + BR(x_1^L)} - x_1^L \quad (ICH)$$

The first inequality is the low type's incentive compatibility condition and the second inequality is the high type's incentive compatibility condition. Subtracting the right hand side of *(ICH)* from the left-hand side of *(ICL)*, and subtracting the right-hand side of *(ICH)* from the from the left-hand side of *(ICH)* yields

$$(5.39) \quad (V_H - V_L) \frac{x_1^H}{x_1^H + BR(x_1^H)} \geq (V_H - V_L) \frac{x_1^L}{x_1^L + BR(x_1^L)}$$

Since $V_L < V_H$, this expression is equivalent to

$$(5.40) \quad \frac{x_1^H}{x_1^L} \geq \frac{BR(x_1^H)}{BR(x_1^L)}$$

From expression (5.36) it can be shown the this best response function $BR(.)$ is an increasing concave function, hence the last inequality is true if and only if $x_1^H > x_1^L$, which proves the claim.

The remaining part of this sub-section identifies the separating equilibria of the game.

Separation

In a *separating* equilibrium the type of contestant I is revealed. The preceding analysis implies that the high type plays her full information strategy, $\frac{V_H}{4}$, and obtains her full equilibrium payoff, $\frac{V_H}{4}$. Denote the low type's separating equilibrium strategy by x_1^{LS} .

To simplify notation, set $L = \sqrt{x_1^{LS}}$.

In equilibrium the beliefs of the contestants should be confirmed. The incentive compatibility constraint for the low type that sustains such an outcome is the following

$$(5.41) \quad \frac{V_L}{2} - \frac{V_H}{4} \leq L(\sqrt{V_L} - L)$$

or, after rearranging

$$(5.42) \quad L^2 - L\sqrt{V_L} + \frac{V_L}{2} - \frac{V_H}{4} \leq 0$$

This inequality holds for

$$(5.43) \quad \frac{\sqrt{V_L} - \sqrt{V_H - V_L}}{2} \leq L \leq \frac{\sqrt{V_L} + \sqrt{V_H - V_L}}{2}$$

The incentive compatibility constraint for the high type is given by

$$(5.44) \quad \frac{V_H}{4} \geq L \left(\frac{V_H}{\sqrt{V_L}} - L \right)$$

or, after rearranging,

$$(5.45) \quad L^2 - L \frac{V_H}{\sqrt{V_L}} + \frac{V_H}{4} \geq 0.$$

Inequality (5.45) holds for

$$(5.46) \quad L \geq \frac{V_H + \sqrt{V_H^2 - V_H V_L}}{2\sqrt{V_L}}$$

and

$$(5.47) \quad L \leq \frac{V_H - \sqrt{V_H^2 - V_H V_L}}{2\sqrt{V_L}}.$$

Next, if the low type is thought to be a high type and maximizes her payoff function given that belief, she (the low type) would obtain

$$(5.48) \quad \frac{V_L^2}{4V_H} = \max_{x_1^L} \left\{ V_L \frac{x_1^L}{x_1^L + BR(x_1^H)} - x_1^L \right\}$$

Hence, the following rationality condition should hold

$$(5.49) \quad L(\sqrt{V_L} - L) \geq \frac{V_L^2}{4V_H}.$$

Inequality (5.49) is satisfied for

$$(5.50) \quad \sqrt{V_L} - \sqrt{V_L - \frac{V_L^2}{V_H}} \leq 2L \leq \sqrt{V_L} + \sqrt{V_L - \frac{V_L^2}{V_H}}$$

To conclude, the range of separating equilibria is given by

$$(5.51) \quad \frac{\left(\sqrt{V_L} - \sqrt{V_L - \frac{V_L^2}{V_H}} \right)^2}{4} \leq x_1^{LS} \leq \frac{\left(V_H - \sqrt{V_H^2 - V_L V_H} \right)^2}{4V_L}$$

Least-cost separation occurs at the upper bound of this interval

$$(5.52) \quad x_1^{LCS} = \frac{\left(V_H - \sqrt{V_H^2 - V_L V_H} \right)^2}{4V_L}.$$

Hence the low type has an incentive to bid below its equilibrium strategy under complete information in order to credibly prove her knowledge. The expression x_1^{LCS} is increasing in V_H and is decreasing in V_S .

5.4 Discussion

Although Tullock's (1980) rent seeking model is extremely simple, some of its general insights seem plausible and relevant to the context of privatization. Clearly, regardless of the protocol of rent seeking and the informational characteristics of the interaction, the higher the value of the prize the larger is the total amount of rent seeking expenses. Hence governments that are known to distribute substantial amounts of subsidies, or have committed sizable parts of their budgets to subsidy programs, would be more reluctant to privatize enterprises to investors that would abuse their vulnerability. Provided that the value of the prize is fixed, however, the nature of the rent seeking game and the characteristics of the contestants are crucial.

As the Underdog Theorem implies, enterprise owners that are relatively more effective in rent seeking, say because of their close relation with government officials, and that have to pre-commit resources to rent seeking, for example by signing a contract obliging them to employ a certain number of workers, tend to devote more resources to such wasteful activities. Therefore governments are more likely to reject privatization bids submitted by relatively more effective 'rent seekers', if for some reason the privatization contract should envisage mandatory clauses related to employment or investment levels. However, this conclusion should be qualified if there are differences in

value that rival enterprises attach to the prize. For example, rival second-mover enterprises could be relatively more effective in generating profits via ordinary market activities and therefore consider the potential for extracting state subsidies as relatively unimportant. This would suppress the first mover's incentives to seek rents.

The effect of informational asymmetries, perhaps somewhat surprisingly, could be welfare enhancing to the extent that informational asymmetries are likely to suppress rent seeking. The informed rent seeker has an incentive to signal its information to other rent seekers, i.e. if the prize is of low value, the first mover would commit relatively less resources to rent seeking in order to credibly prove what she knows. With asymmetric information, the total amount of rent seeking expenses could be well below the total amount of rent seeking expenses in the case of perfect information or in the case of imperfect but symmetric information, i.e. when both rent seekers lack information. This implies, for example, that the government may in fact choose to reveal its readiness to dispense rents only to one of the rent seekers in order to induce an informational asymmetry. Obviously, the government would be more willing to privatize an enterprise if such informational asymmetries are more likely to persist.

5.5 Conclusion

This chapter addressed the question of how rent seeking that is expected to occur after privatization affects the government's decision to privatize an enterprise in the first place. The analysis implied, within a very circumscribed setting, how the rent seeking protocol interacts with the contestants' effectiveness and information in determining the amount of rent seeking expenses. It also drew some conclusions about how the government could

induce changes in the protocol of interaction and the information available to contestants in order to reduce these expenses. Burdensome privatization contracts could trigger more rent seeking as they are likely to transform a simultaneous, Cournot-type, contest, into a sequential, Stackelberg-type, contest. On the other hand, informational asymmetries reduce the incentives to devote resources in the pursuit of rents.

Chapter 5 – Conclusion

Governments launch privatization programs in order to improve enterprise performance, raise revenue, and, in the case of countries transiting from command to market based economies, as part of a large-scale systemic transformation. Most analysts, government officials and advisors believe that privatization works because it insulates enterprises from political influence and places them in the hands of owners and managers that have incentives that are more in line with profit maximization and overall efficiency. A substantial number of empirical investigations showed that in the majority of cases enterprise performance did improve after privatization. Hence, in technical terms, from both ex ante and ex post points of view, privatization can be considered a reform strategy that passes the Kaldor-Hicks compensation test – in principle the reform winners could compensate the reform losers and still be better off with privatization than without privatization. Yet, reformers often had to face a number of impediments to privatization.

This thesis focused on three such impediments.

First, the potential new private owners might be uncertain about the return that an investment in acquiring a stake in a state-owned enterprise would yield. This uncertainty could be related to either the inherent characteristics of the enterprise in question or the government's future policies, e.g. the possibility of expropriating the private owner's part of the enterprise's profit. Chapter three showed that, under certain conditions, if the selling government has an informational advantage about the enterprise's future profit, it could signal this information by partially privatizing the enterprise. The argument complements Perotti's (1995) model, which shows that partial privatization can signal the

government's commitment to not expropriating the private portion of the enterprise's future profits. It should be noted that, in a world of perfect information, partial privatization does not maximize the government's revenue, neither does it further the goal of de-politicizing decision-making within the enterprise. Empirical evidence showed that partially privatized enterprises often tend to perform better, or at least as good as, fully privatized enterprises – a fact that was certainly unexpected. The idea of signalling proposed in chapter four provides a possible explanation of these apparent puzzles of partial privatization. If the signalling argument is correct than partially privatized enterprises should have exhibited better performance indicators prior to divestiture. Indeed, data on privatization programs in advanced capitalist economies analyzed by Megginson, Nash and van Randenborgh (1994) suggest that this was the case.

Second, the privatization of an individual enterprise is often opposed by the enterprise's labor force or by other pressure groups that prefer state ownership. Chapter four showed that, under certain conditions, the government could implement a partial privatization in order to overcome this obstacle. Partial privatization could ensure that the future private owner faces a soft budget constraint and would therefore launch investment projects that are inefficient but increase the level of employment at the enterprise. Hence partial privatization commits the government to 'maintaining' high employment by essentially depriving it of a commitment mechanism that would prevent it from letting the enterprise go bankrupt because of launching inefficient investment projects. In the setting of chapter four, partial privatization is a credible commitment since, as Dewatripont and Maskin (1995) argue, informational asymmetries and sunk costs might force even an orthodox profit-maximizing funding center to afford soft budgets. Hence

workers need not worry that a future right-wing government would fail to cater to their preferences. An important assumption behind this argument is that workers care solely about their employment. It should be added that this assumption ignores the fact that opposition to privatization may be motivated by concerns related to national pride or the enterprise's status of a 'strategically important' asset.

Third, rampant rent seeking activities associated with privatization are said to pose another significant impediment to policy makers' reform plans. Chapter five investigated this claim. The key argument was that governments that seek to minimize the amount of resources devoted to rent seeking *ex post*, may be reluctant to sell enterprises that would prove attractive primarily in terms of the influence that their new owners would come to wield *vis-à-vis* other enterprises in the contest for government subsidies.

As Frydman and Rapaczynski (1994) observe, many enterprises in transition countries are valuable exactly because of the politically motivated rents that their owners can extract from the state. By reviewing some of the results in the literature on rent seeking contests, chapter five argued that, at a very abstract level, the protocol of rent seeking interaction, the effectiveness of the players involved in the rent seeking contest and the information available to players are important factors that determine the amount of resources devoted to rent seeking.

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Appendix

Figure for the model in chapter 4

