Essays on ownership and soft budget constraint.Evidence from transition countries

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Chapter 1

General introduction

> "*A major source of inefficiency in public firms stems from less-prosperous firms being allowed to rely on the government for funding, leading to "soft" budget constraints. The state is unlikely to allow a large state-owned enterprise to face bankruptcy.*"
>
> Megginson and Netter (2001, pp.330-331)

The economic policy of privatization, defined as the deliberate sale by a government of state-owned enterprises (SOEs) to private economic agents, is now in use worldwide. Demsetz (1998) considers that it is primarily the collapse of the former Soviet-bloc countries in 1989-1991 that initiated this turn toward privatization. For Megginson and Netter (2001), it was the perceived success of Britain's Thatcher government in the early 1980s that convinced many other countries to begin divesting SOEs. We still do not know who is right. But the point is that privatizations were undertaken largely on faith in both cases. As Demsetz (1998), Megginson and Netter (2001) and Schmidt (1996b) highlight, there was hardly any theoretical analysis of the costs and benefits of privatized *versus* nationalized enterprises that could have served as a guideline for which enterprises should be privatized and how this should be done. When the British government launched its program in the early 1980s, many economists were skeptical: they considered gov-

ernment ownership should be preferred as soon as market imperfections, such as monopoly power or externalities, were suspected. Thus government should **at least** own telecommunications, postal services, electric and gas utilities, and transportation services such as airlines, railroads and port authorities (Megginson and Netter, 2001, Shleifer, 1998). In Central and Eastern Europe, privatization was of a different nature than in Britain. It involved nothing less than a complete redefinition of property rights for literally thousands of enterprises that were operating in potentially competitive industries. Because of the collapse of the centralized planning system, most of economists acknowledged, at the outset of transition, that a specific, all-encompassing ownership reform was necessary (Kornai, 1990a, Lipton and Sachs, 1990b). However, a minority of economic theorists like Bardhan and Roemer (1992) highlighted that, contrary to popular impression, the claim that full-scale private ownership was necessary to achieve an efficient and vigorous economy was proved neither by history nor by theory.[1] Furthermore, even if in early transition debates the majority of economists agreed on the goal of an economy dominated by private ownership, there were conflicting views on how best to attain this, through fast privatization (e.g., Boycko *et al.*, 1995, Lipton and Sachs, 1990b) or through gradual sales (e.g., Bolton and Roland, 1992, Kornai, 1990b).

Economic theory found it difficult to predict under what circumstances privatized firms would outperform SOEs. Advocates of privatization, and especially economists favoring massive giveaways in transition economies, limited themselves to repeat the simple argument that is summarized by the epigraph of this introduction: contrary to a private firm, a public enterprise is not subject to the discipline of the bankruptcy process because the government always bails it out in case of difficulty. Managers of SOEs expect to be rescued in case of trouble, so managerial incentives are reduced. In other words, the manager of a public firm operates under the built-in expectation of what Kornai calls the "soft budget constraint" (SBC). However, the difficulty with

[1] See also Stiglitz (1994) who doubted about the importance of private property for enhanced economic performance and emphasized the role of competition and the importance of financial institutions and corporate governance.

this argument is that public enterprises may be shut down (although one would expect that this would occur less frequently than if the firm were private); and governments do bail out some unprofitable private firms (Laffont and Tirole, 1991).

Originally formulated by Kornai (1979) to illuminate economic behavior in socialist economies marked by shortage, the concept of SBC is still regularly invoked in the literature on economic transition. Two reasons explain this fact. The first one is that SBC problems still constitute a central policy issue in transition economies, despite of important privatization. Subsidies were cut drastically early in transition. (However, they are still important in the former Soviet Union -FSU-). This is not a surprise, since such cuts were a standard recommendation of the International Monetary Fund (IMF) macrostabilization programs. But other methods have come to the fore: wage arrears, trade credit and bank credit that has become the main mean of softening the budget constraint in several countries (Kornai, 2001, Kornai *et al.*, 2003, Roland, 2000). Second, and surprisingly, although Kornai (1979) demonstrated that the centralized economies of Eastern Europe were rife with this syndrome, theoretical articles that identify the circumstances that lead to soft budgets have been proposed only since the 1990s. The efforts made in that direction will be surveyed in this introduction. As we will see, some of these models stress the distribution of ownership rights (e.g., Boycko *et al.*, 1996, Shleifer and Vishny, 1994). But most of them turn on the way credit allocation is organized (e.g., Dewatripont and Maskin, 1995).

This thesis essentially focuses on transition economies and deals with important points that are related to the discussion above. We deal with these countries because privatization has been an institutional large-scale policy reform. The debate which opposed partisans of massive giveaways and partisans of gradual sales led in practice to different privatization policies. Some countries adopted fast giveaways to outsiders (the Czech Republic) or insiders (Russia); others used management employee buy out to sell their small and medium enterprises (Slovenia) or favored sales to outsiders (Hungary). Thus, the transition experience might be considered

as a mammoth quasi-experiment that can offer lessons of profound importance for economic studies and economic policy in other countries that still have to undertake large scale privatization programs (Djankov and Murrell, 2002).[2] Second, the concept of SBC is now widely used to describe similar phenomena in developing and developed countries. The collapse of the banking sector of East Asian economies in the 1990s or the Chrysler Corporation's bailout by the US government in the early 1980s can be usefully thought of in SBC terms. Analyses of enterprise-state-bank relations in transition countries offer considerable potential for identifying the determinants of soft budgets, much more so than do studies of stable capitalist economies.

Before going any further, let us focus briefly on the objectives of this thesis. Our first objective is to clarify what are the methods of privatization that generate gains in macroeconomic performance. In doing so, our goal is to point the way to a revised paradigm for privatization policy in transition economies. Sheshinski and López-Calva (2003) highlight that little macroeconometric evidence exists on the effects of privatization. Now that sufficient time has passed, enough data has become available to examine these concerns. A common though implicit thread underlying these questions is if some methods of privatization permit to harden the budget constraints.

Our second objective is to propose an empirical research on SBC. Despite considerable progress in the last decade to give theoretical explanations to this phenomenon, empirical research on its determinants is still in its infancy (Djankov and Murrell, 2002, Kornai *et al.*, 2003). In line with the works of Kornai, an empirical measure has to capture the expectations of managers to be bailed out in case of trouble. Indeed, if a bailout is entirely unanticipated, there is little point in ascribing

[2] In particular, two Asian countries deserve special attention. The first one is the People's Republic of China which has been in transition since it implemented dual track price liberalization program in agriculture in 1979 (see Qian, 2003, Roland, 2000). Since 1995, there have been numerous privatizations of small and medium sized enterprises (Qian, 2000). However, most of the large-scaled enterprises remain state-owned and are confronted to the SBC syndrome. The other special Asian case is India. India has adopted a major liberalization program since 1991 in response to highly disappointing state firms performance (Majumdar, 1996), but privatization has not figured prominently in the reform agenda (see Banerjee *et al.*, 2005, Dinç and Gupta, 2007).

the event to a SBC: the syndrome is truly at work when firms expect to be rescued from trouble because those expectations in turn affect their behavior (Kornai *et al.*, 2003, p.1104). Furthermore, empirical works are not closely grounded in theory (Kornai *et al.*, 2003). Our objective is to propose an empirical work in which we study whether firms which obtain a loan expect their bank to extend the term of their loan if they fall behind in their bank repayments. This empirical work is close to the theoretical line of research initiated by Dewatripont and Maskin (1995) who view soft budgets as the continued extension of credit even when the substandard performance of an already-financed investment project has been revealed.

Third, SBC problems currently constitute a central policy issue in transition economies, especially in the FSU. In these countries, banks tend to give preference to distressed firms. The fact that credit to the real sector has declined substantially to the detriment of the best firms is all the more surprising since there has been a boom in the number of commercial banks in these countries, particularly in Russia. Furthermore, these transition economies have appeared to be in a trap of continual budgetary pressures and high taxation. Our third objective is to develop a simple SBC framework that explains both the fiscal externality and the misallocation of loans, the latter being the result of the former. We explain that banks refuse to lend to firms, or lend only to bad firms, because the government uses fiscal means to support these firms that have a SBC. This framework allows to derive some implications that are empirically tested.

Before presenting in detail the problematics of our thesis, it seems important to draw a brief historical overview of privatization and to explain why the SBC problem (and more generally incentives) might be crucial for state firms.

1.1 A historical and geographical overview of privatization

People associate privatization program, at least in developed countries, with Thatcher's government in the early 1980s. Nevertheless, Megginson and Netter (2001, p.323) find earlier instances: they identify partial sales of state-owned firms by the Adenauer government in the Federal Republic of Germany in the early 1960s; and thought confined to the steel industry in the early 1950s, they remark that the Churchill government denationalization is perhaps the first privatization program. But this is wrong. As Bel (2006, 2007) points out, there is an important earlier case: the privatization policy in Germany under the rule of the National Socialist Party (Nazi). The Nazi party privatized state firms that operated in competitive industries such as steel, coal, shipping lines and banking, as well as state monopolies, such as rail transport and local public utilities (Bel, 2007).[3] Germany was alone in developing a privatization program in the 1930s. The Great Depression spurred state ownership in capitalist countries. And until Thatcher's government came to power in 1979, it was considered that public enterprises cured market failures.

Although the Thatcher government was not the first to launch a large privatization program, it is without question the most important in developed economies. In 1979, state-owned enterprises accounted for 10.5 percent of Britain's gross domestic product (GDP). An important part of public enterprise output came from state monopolies in gas, electricity, telecommunications, water, postal services and rail transport. However, state-owned enterprises also existed in (potentially) competi-

[3] An interesting point is that the origin of the term "privatization" is often attributed to a 1969 book by Peter Drucker (1969) (see, for example, Megginson, 2005, p.15, Megginson and Netter, 2001, p.324). This attribution is incorrect. Merlin (1943, p.207) was probably the first to use the word "privatization" in the social science literature in English. This term appears to have come into English on the heels of the invention in the 1930s of the German term "*Reprivatisierung*" (Bel, 2006). However, in Great Britain, those who were discussing the sale of government-owned firms to the private sector used the terminology of "denationalise" before Thatcher. Margaret Thatcher reached for the term "privatisation" because "denationalisation" had a negative and unappealing connotation: "denationalisation" may have sounded too much as if ownership was being surrendered to foreigners, while "privatisation" did not carry such an implication (Bel, 2006).

tive industries like steel, coal, oil and vehicles (Vickers and Yarrow, 1991). Overall productivity growth was in line with that in the British private sector but state firms had persistent financial deficits in the pre-privatization period (Vickers and Yarrow, 1991). Massive share issue privatizations during the 1980s and the early 1990s reduced the role of state-owned enterprises "*to essentially nothing after the Tories left office in 1997*" (Megginson and Netter, 2001, p.324). Following the British experience, many other developed countries began divesting SOEs through public share offerings during the 1980s and 1990s. The reason was that poor profitability (in some cases huge losses), low productivity and high debt were the norm for state firms. In order to keep these firms in business, government funds were made available and these firms were never exposed to the risk of bankruptcy. In France, where the state had assumed control of significant parts of production, the privatization programs began in 1986-1988 with Chirac's government which privatized 22 enterprises. A new privatization program was launched by the Balladur government in 1993, and continued by Jospin. During this period, other European countries, including Germany, Italy and Spain, launched large privatization programs.[4]

State ownership had grown in developing countries for slightly different reasons: public ownership was considered as necessary to resolve coordination issues and promote growth. During the 1940s and 1950s a set of far-reaching ideas was developed regarding demand externalities, strategic complementarity and economic development. In his seminal paper, Rosenstein-Rodan (1943) suggested that if various sectors of the economy invested simultaneously in new production technologies, this could be self-sustaining even if it were not profitable for a single producer to increase production alone because of market limitations. Where this is true, it suggests the need for a government that simultaneously coordinates investments in several sec-

[4] Concerning Italy, Bertero and Rondi (2000) report that public firms responded to financial pressure by increasing total factor productivity and reducing employment.

tors of the economy to overcome underdevelopment.[5] These strategies have widely failed. In particular, the state sector has been reported to be burdened by a substantially oversized workforce in much of the Third World (Buffie, 1998).[6] That is why Latin America, and to a lower extent Africa, have embraced privatization. In Latin America the first privatization program was in Chile, when Pinochet ousted the Allende government.[7] Other Latin American countries launched vast privatization program, in particular Argentina, Bolivia, Brazil and Mexico.[8] In Africa, there has been a generally much higher level of privatization activity than is commonly believed. For example, Benin, Guinea and Mali divested a majority of state-owned enterprises between 1980 and 1995, as Bennell (1997) highlights. However, African states have generally been slow and reluctant privatizers. On average, Africa has privatized a smaller percentage (about 40%) of its state firms than other regions, far less than in Latin America or transition economies. Some manufacturing and most infrastructures still remain in state hands because of opposition to privatization by workers (most notably in Ghana, Malawi and Tanzania) and the lack of transparency

[5] Murphy *et al.* (1989) offer an analytical interpretation of the Rosenstein-Rodan idea. They propose a general equilibrium formalization where the economy can find itself both in an underdeveloped equilibrium, where producers have no incentive to industrialize, and in a fully industrialized one, where each sector of the economy has increased production.

[6] Remark that overstaffing of state firms might be understood as a by-product of SBC. According to Kornai (1980), SOEs exhibit an almost insatiable appetite for inputs because their managers stand to benefit from any profitable expansion of output, but have nothing to lose if the enterprises incur losses.

[7] In Chile, between 1970-73, the Allende government tried a democratic transition from capitalism to socialism; it involved an increase in the size of the state firm sector to more than 30 percent of GDP (Vickers and Yarrow, 1991, Larraín and Winograd, 1996). Companies previously nationalized were transferred to their original owners (between 1974-1975) and firms in which the Allende government had taken an ownership stake or which it had created were privatized (between 1975-1983). However, many of these same firms were renationalized once Chile entered its debt crisis in the early 1980s (Megginson and Netter, 2001). A ultimate wave of privatizations was launched in 1986 (Vickers and Yarrow, 1991).

[8] For a description of the Mexican privatization program launched in 1983, see La Porta and López-de Silanes (1999); for Argentina, see Larraín and Winograd (1996); for a brief discussion of privatization in Brazil and Bolivia, one might read Megginson and Netter (2001, p.326).

in transactions.[9]

The last but not the least important region to adopt privatization programs is the former Soviet-bloc countries after the collapse of communism in 1989-1991.[10] There were some similarities with Thatcher's Britain and post-Allende Chile, although the extent of state control over economic activity was greater.[11] Furthermore, in the formerly socialist economies, a large proportion of privatization had to concern competitive industries. This was well summarized by Lipton and Sachs (1990a, p.127):

> "*Prime Minister Margaret Thatcher, the world's leading advocate of privatization, has overseen the transfer of a few dozen state enterprises to the private sector in the past decade. Poland, however, has more than 7800 candidates for privatization.*"

The problems with state-owned firms were similar to those of developed and developing countries: overstaffing and a lack of clear incentives (Lipton and Sachs, 1990b) that can be understood as some consequences of SBC. Kornai (1990b) believed that to bring about effective ownership, enterprises should be sold carefully and mostly on a one by one basis rather than freely distributed to the public or insiders. But many researchers advocated rapid privatization through the free distribution of shares. It included Blanchard *et al.* (1991), Boycko *et al.* (1995) and Frydman and Rapaczynski (1991) among others.

Not surprisingly, various macroeconomic models, which study the process of re-

[9] Nellis (2005) contains detailed discussions of privatizations in Africa. While rigorous assessments of privatization are increasingly available in Latin America and transition economies, such studies are relatively rare in Africa. These rare studies, however, find that firms perform better after privatization and privatization contributes to economic welfare. Jones *et al.* (1998) analyze 81 privatizations in Côte d'Ivoire covering the electricity sector, as well as firms operating in (potentially) competitive sectors like agro-industries and services. Dealing with the provision of water in Guinea, Ménard and Clarke (2002, p.274) conclude that reforms "*increased coverage and improved quality*". Despite some problems with private provision of waters, they argue that the situation would have been worse if the water management had remained in state hands.

[10] These countries are Albania, Armenia, Azerbaijan, Belarus, Bulgaria, Croatia, the Czech Republic, Hungary, Estonia, Georgia, Kazakhstan, the Kyrgyz Republic, Lithuania, Latvia, Macedonia, Moldova, Poland, Romania, Russia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

[11] In 1990, the countries with the highest private sector share of GDP were Croatia (15%), Hungary (25%) and Poland (30%) (EBRD, 1999).

allocation from a declining state sector to a privatized sector in Eastern Europe, assume that privatization makes the firm more productive and efficient. (A second assumption that is common to these models is that there are frictions in the economy, so the process of sectoral reallocation is likely to result in unemployment of factors of production.) Examples are Aghion and Blanchard (1994), Chadha and Coricelli (1997) or Roland and Verdier (1994).[12] However, they highlight that the assumption that privatized firms are more efficient is far from being evident. In particular, Aghion and Blanchard (1994, p.294) remark:

> "*We make no distinction between privatization and restructuring. But* [...] *the relation between privatization and restructuring is much less tight than we assume here. Privatization does not necessarily imply restructuring.*"

1.2 Privatization, inefficiency and soft budget constraint

The quotation of Aghion and Blanchard (1994) reflects well the lack of theoretical analysis of the costs and benefits of privatized *versus* nationalized enterprises at that time. A popular point of view is that production is more efficient in a private firm than in a public firm because better incentives can be given to managers. But

[12] In Roland and Verdier (1994), SOEs are also assumed to lose money, that is their output is lower than the fixed wage going to workers. The subsidies are financed from taxes paid out of wages. On the contrary, in Aghion and Blanchard (1994) and Chadha and Coricelli (1997), the tax rate serves to finance unemployment benefits. Remark that the literature dealing with the transition in China also proposes various macro models with an inefficient state and an efficient non-state sector. However, the non-state sector is not to be confused with the private sector. Although it includes private enterprises, the non state-sector is also made up of collective and township and village enterprises that are owned by local governments (Brandt and Zhu, 2000). Miyamoto and Yu (2000) and Brandt and Zhu (2001) are good examples. In Miyamoto and Yu (2000), the state firms are characterized by overstaffing. They propose a dynamic model to analyze capital accumulation in state and non-state sectors and the fiscal and monetary policy requirements for the coexistence of the two sectors are derived. Brandt and Zhu (2001) assume that the government uses the monetary and financial system to support the state sector. They explain how the growing tension between a long-running commitment to the state sector and economic decentralization affect inflation cycles and the growth of both state and non-state sectors in China.

if it is the case, the ultimate question is: why the government does not reach the same productive efficiency by mimicking the private owner (that is by given the same incentive schemes to managers) (Williamson, 1985). Furthermore, a public firm might choose a socially more efficient production level because the government internalizes externalities, whereas a private owner just maximizes his own profits.

Some arguments were proposed in order to explain why public ownership suffers serious efficiency losses. We first present the two main arguments (which can be linked), that we call the agency and the SBC problems. We also explain why, in their basic formulation, they are theoretically incomplete. We then focus on the SBC problem and explain how recent theoretical models can explain when it is more likely to be present.

The agency problem

Let us take the agency problem first. Agency problems occur when the manager maximizes his own utility function but not that of the owners of the firm. This agency problem is clearly absent in owner-managed firms under private ownership.

But remark that if we look to activities outside the small-scale sector of trade and crafts, the problem of separation of ownership and control also exists in the modern private corporation. Thus, with the separation between ownership and management in such a capitalist firm, managers may not maximize the share value of the firm and may instead feather their own nests. The large body of shareholders may have a difficult monitoring problems and a capitalist firm owned by thousands of investors may have difficulty in ensuring responsibility.

Nevertheless, the argument is that the managers of state-owned enterprises are poorly monitored because their firm is not traded in the market, as in the case of any private firm. Stock market prices contain information about the firm's future prospects and thus about the managers' long-term decisions. A public enterprise deprives itself of a measure of managerial performance and reduces managerial incentives. But as Laffont and Tirole (1991) highlight, economists have never demonstrated that the stock market is the only instrument, or the most efficient instrument,

to obtain outside information about a firm's health.[13]

The soft budget constraint problem

The second (simple) argument against state ownership is the SBC argument (state firms have soft budgets so privatization will solve the problem). The difficulty with this argument is that public enterprises may be shut down. Furthermore, Sappington and Stiglitz (1987) argue that governments also often intervene to rescue private firms from bankruptcy. Even Kornai (1980, 2000, 2001) who much emphasizes the strong relation between state ownership and the SBC, and between private ownership and the hard budget constraint (HBC), indicates that the SBC syndrome could appear in economic environments based entirely on private ownership.

In his early writings on the SBC syndrome, Kornai (1980) gave particular prominence to state paternalism: the state treats its enterprises like children, patronizing them and it does not abandon them when they are in trouble.[14] Thus, for Kornai (1998, p.537), this explanation is system specific, deriving from the official ideology of the socialist system.

However, there is also a difficulty with this argument. One might argue that socialism is committed to a fully employed society and this ideology may have constrained the state of Eastern European countries to prop up failing enterprises for the sake of employment. Nevertheless, as pointed out by Maskin (1996, p.126) paraphrazing Marx, "*ideology is only the reflection of the underlying economic structure*". An economist wants an explanation that turns on the economic not the ideologic differences between socialism and capitalism. Furthermore, SBC phenomena also

[13] The hypothesis that markets are informationally efficient is especially challenged by Grossman and Stiglitz (1980) who highlight that there is an impossibility. The idea is the following. If everybody believes that the market is efficient, nobody will have an incentive to look for arbitrage opportunities. But the efficient market hypothesis relies on the idea that arbitrageurs correct any mispricing in the market. Consequently, if everybody believes that the market is efficient, nobody will detect and correct a possible mispricing and the market will no longer be efficient. The efficient markets hypothesis is also challenged by Shiller (1989) who empirically identifies an "excess volatility" in the price changes on stock markets.

[14] In his work with Weibull (Kornai and Weibull, 1983), the government simply bails out loss-making firms because of paternalism. The more a firm can expect to be bailed out by the government in case of trouble, the more it will be inclined to exhibit almost insatiable demand for inputs.

appear under other systems than socialism. Soft budgets have been common in Eastern European countries, especially in countries that quickly privatized as the Czech Republic or Russia (Kornai, 2000).

Thus, there are two puzzles. The first one is why private or privatized firms might be more likely to have a HBC. This first puzzle is part of a more general question that is under what circumstances private or privatized firms will outperform SOEs. The second puzzle is that SBC phenomena exist with private ownership. Thus the second question is to understand possible other explanations than the distribution of ownership rights.

1.2.1 Ownership rights and the soft budget constraint

Sappington and Stiglitz (1987) argue that both private and public production of goods involve significant delegation of authority and thus are similar in various respects. But they highlight that there are two arguments in favor of (or against) privatization. We call the first one the "government intervention" argument. The basic idea of this argument is that public ownership reduces the costs of government intervention and makes intervention more likely. The second argument relies on the impossibility of writing complete contingent contracts. We present these two arguments below because they have often been proposed as explanations of the SBC since the mid 1990s, especially the first one.

Government intervention in firms, ownership rights and soft budget constraint

Sappington and Stiglitz (1987) highlight that the main difference between public and private production of services concerns the transaction costs faced by the government when it intervenes in the production activities. Under public ownership, the government has some rights of control.[15] On the contrary, private ownership puts some distance between the government and the producer. Consequently, pub-

[15] Sappington and Stiglitz (1987) highlight that transaction costs of intervention are related to residual rights of control. They note that this argument of control rights is inspired by Grossman and Hart (1986, p.694) who define ownership as the power to exercise control.

lic ownership reduces the costs of government intervention, and makes intervention more likely.

The models of Boycko *et al.* (1996) and Shleifer and Vishny (1994) are good examples of this idea. They associate the SBC syndrome with the interventions of (assumed) self-interested politicians in firms. In these models, the politician can make a transfer from the treasury to an efficiency-oriented manager to persuade him to achieve an inefficiently high level of employment.[16] Boycko *et al.* (1996, p.314) and Shleifer and Vishny (1994, p.1000) consider this transfer as SBC. When the firm is state-owned, the treasury has cash flow rights and the politician control rights. By this, the politician has power over the manager. Consequently the politician can choose an amount of excess employment and subsidize the manager who is brought down to his reservation utility, assumed to be zero. However, when the manager has control rights, his reservation utility is different. Without government intervention, the manager can get his share of the profit without excess employment. Therefore, the transfer to the manager increases. Consequently, it is much more costly for the politician to intervene in a private firm than in a state-owned firm.

At least two remarks can be done. First, softness here is viewed as something desirable by politicians to induce an efficient-oriented manager to make an inefficient choice. In this definition, it has nothing to do with a problem of incentives, as it is usually considered.

Second, the assumption of self-interested politicians is crucial in these models. If we assume that they are benevolent, they can be interpreted in a diametrically opposed way: state ownership will be at least as efficient (Kornai *et al.*, 2003, p.1128 and Roland, 2000, p.203). Indeed one might argue that the efficient level of employment is not achieved in absence of government intervention.[17] In such a case, one

[16] Remark: the definition of efficiency is not explicit in these models; it is only assumed that this efficient level is achieved in absence of government intervention.

[17] For example, in a recent paper dealing with unemployment in France, Blanchard and Tirole (2003) consider that firms do not internalize social costs and propose a system of tax (but not a system of subsidies) to internalize these costs. Their idea is close to the polluter pays principle in environment.

would argue for the nationalization of private firms! In this case, the subvention of SOEs would be the result of a benevolent government that tries to maximize global welfare.

Incomplete contracts and soft budget constraint

The other explanation of why ownership rights matter is based on the incompleteness of the contracts. The starting point of this literature is that it is impossible to foresee all the contingencies. The seminal article is Grossman and Hart (1986). However, Grossman and Hart (1986) address the question whether a manager should own the assets he works with or whether he should be an employee-manager. In other words, they do not explain why it makes a difference for a firm whether its company is public or private. Laffont and Tirole (1991), Schmidt (1996a,b) and Hart *et al.* (1997) have tried to adapt the incomplete contracts approach to the privatization context.

The models of Schmidt (1996a,b) are especially interesting because they explicitly refer to the SBC; furthermore they show that the syndrome may occur with a benevolent government. These papers however differ from Grossman and Hart (1986) symmetric information framework. They focus on an asymmetry between the government and the firm (as do Laffont and Tirole, 1991). They argue that the government is less informed about a privatized than a state-owned firm. Following the terminology of Grossman and Hart (1986), they consider that access to inside information of the firm is not a specific right, that is a right specified in a contract. It is a residual rights of control tied with ownership (ownership is the purchase of these residual rights of control).

The intuition of these models is as follows. The manager of the firm derives some benefit from a high production level and has to make a private investment in cost reduction before production takes place. The government wants low cost so it tries to improve the manager's incentives. To do that, it has to commit *ex ante* to a subsidy scheme that punishes the manager if costs turn out to be high by liquidating the firm. However, the government suffers from a lack of precommitment

when the firm is state-owned. Indeed, it takes care about social benefit because it is benevolent; and when the firm is state-owned, the government can observe the cost function *ex post* (that is after the effort to reduce the cost is done); so it would always choose a production level that is *ex post* efficient, thus forgiving high costs and paying more subsidies than announced *ex ante*. Anticipating this, the manager has little incentives to try to save costs. This is the definition of a SBC. When the firm is privatized, the government does not observe the realization of production costs *ex post*. The optimal regulation scheme generates an informational rent for the manager if costs are low. This informational rent, in turn, provides the manager with incentives to engage in cost reductions *ex ante*.

These models are very interesting because they explain why a SOE might be more likely to have a SBC. Moreover, and contrary to Shleifer and Vishny (1994), expectations are at the heart of these models. However, it does not explain why, despite important privatizations, soft budgets are still common in transition countries (Kornai *et al.*, 2003). Furthermore, the SBC is identified with subsidies in these models. But subsidies were cut rather drastically in transition, and have been reduced in a gradual way since then.[18] In many transition economies loss-making firms have continued to be bailed out *via* different channels, especially bank credits. A number of empirical surveys confirm this view. In particular, banks have tended to give preference to distressed (state-owned or privatized) enterprises when allocating credit, and have tolerated late or omitted repayments; see studies on Russia (Brana *et al.*, 1999), on Romania (Coricelli and Djankov, 2001) and on various post-socialist countries (Kornai, 2000, Schaffer, 1998) for the nineties; see the EBRD *Transition Report* of 2006 to see that the problem is still persisting, e.g., in Bulgaria (p.102) and Uzbekistan (p.194).

[18] As previously said, exceptions are some countries of the FSU (e.g., Belarus, Russia and Ukraine) where subsidies have represented at least a three times larger share of GDP than in other countries since the beginning of transition (see Roland, 2000, p.287 as well as chapter 4 for more recent data).

1.2.2 Credit allocation and soft budget constraint

An important line of research that does not relate the softness to the ownership of the firm is the one that follows the model of Dewatripont and Maskin (1995). This model views soft budgets as the continued extension of credit even when the substandard performance of an already-financed investment project has been revealed. Because of asymmetric information, even poor projects are initially financed. A bank can observe the project quality only *ex post*, that is only after it has already made a significant capital investment. If refinancing still maximizes the expected value of funds that can be recovered, the bank refinances the project. The manager of the firm knows *ex ante* if the project is a poor one. And if the project is financed, the manager knows if the project will be extended or not. If the bank refinances the bad project by injecting additional capital, the manager's private benefit will be positive by assumption (the private benefit might include such things as managerial perquisites and reputation enhancement). If a poor project is not refinanced (that is if it is liquidated), the manager's private benefit is negative. This assumption is justified by the manager's loss of reputation. The assumption that the private benefit of a refinanced poor project is positive is justified by the fact that a manager can extract more from a project the longer it continues. Given these assumptions, a manager that has a poor project will submit it if he expects that his project will be refinanced.[19] *Ex ante* uncertainty is very important in this kind of model. If the bank could identify poor projects and good projects *ex ante*, it would only finance good projects. However, because *ex ante* it cannot distinguish between these projects, it will either finance all projects or none of them. A SBC equilibrium occurs when poor projects are submitted by managers, financed by the bank and refinanced when

[19] However, note that the Dewatripont and Maskin (1995) model views the SBC as a dynamic incentives problem, like Schmidt (1996a,b). So it might apply to another context than a bank-firm relationship. As far as a funding source cannot commit to keep an enterprise to a fixed initial budget, there is a soft budget problem. That is for example the case of Segal (1998). In this paper a benevolent government may choose to bail out an unprofitable monopoly, because of social concern about output. Anticipating a bail out, the firm may deliberately make its product costly. It makes the firm unprofitable and its threat of shutdown credible. Using this threat, the firm can extract a part of the social surplus in form of subsidies.

the substandard performance of the project has been revealed.

As in the models of Schmidt previously described, the SBC is a problem of time inconsistency. If the bank were able to credibly commit itself not to extend the term of the loan *ex post*, the firm would not submit it. In such case, this equilibrium is a hard budget equilibrium (poor project are not submitted by managers because they expect that they will not be refinanced when the substandard performance of the project will be revealed; thus only managers with good projects submit their proposal). The interesting question that the theoretical literature on the subject tries to answer is the institutional conditions under which there exist HBC or SBC. In other words, what are the possible reasons that increase the probability to have an extension if the project is a bad one.[20]

In the article of Dewatripont and Maskin (1995) if credit is decentralized, that is if refinancing an enterprise requires funds from an outside bank, the constraints imposed by asymmetric information on bargaining between banks may make refinancing unprofitable.[21] The bank's ownership structure might also matter. If a private bank is presumably in the business of maximizing profit, it is not the case of a state-owned bank. A state bank is controlled by the government and, therefore, its financing decisions reflect the government's objectives. SBC theories explaining that a state bank will rescue a firm in case of trouble to complete a bad project are of two kinds. If the government is benevolent, the state bank maximizes the overall social welfare. So if a firm has a bad project, the state bank will extend the term of the loan if the demise of the firm might cause external damage greater than the

[20] Various authors also study how the refinancing can generate well-known syndrome of the Soviet economies: Qian (1994) shows how the refinancing can generate shortages; Qian and Xu (1998) demonstrate that softness can explain the poor performance of the Soviet countries to develop new technology.

[21] The specific mechanism in the model that explain why decentralization hardens the budget constraint is that the bank that makes the initial loan does not have the funds to refinance a poor project. Thus, an additional creditor is required. However, the initial bank has an informational advantage over the new creditor. This asymmetry generates an inefficiency because it reduces the return from refinancing and makes liquidation more attractive. As Maskin (1999) makes clear, the theme centralization/decentralization is a common theme of several theoretical contributions to explain the softness: for example Qian and Roland (1998) investigate devolution of government as a method for hardening budget constraints; Segal (1998) focuses on the centralization of production.

cost of rescue (for example if it is a monopoly, as in Segal, 1998). If the government values these firms for their political support, the government considers the political benefit of keeping project workers employed. Seen this way, the model could be interpreted along the lines of the political motivation of Boycko *et al.* (1996) and Shleifer and Vishny (1994).

1.3 Contributions of the thesis

This thesis builds upon the literature reviewed in section 1.1 and section 1.2 (especially subsection 1.2.2).

In chapter 2, we contribute to the literature on transition by seeking to clarify what methods of privatization contributed to the macroeconomic gains and losses from privatization in transition economies.

The process of privatization in the former communist countries has generated a considerable microeconometric literature. The empirical literature on the impact of privatization on economic performance has been inspired by Boardman and Vining (1989) whose work is in the non-transition country context. This literature is of two types: case studies of a small sample of firms (e.g., Barberis *et al.*, 1996) and cross-industry econometric studies (e.g., Frydman *et al.*, 1999). Usually, the degree of enterprise restructuring has been captured by firm performance, with performance measured by variables that are objectives of companies operating in market economies. Thus, sales or revenue have been used (e.g., Frydman *et al.*, 1999) under the premise that the ability to have customers is an indicator of successful change within the enterprise.[22] Profits have been often used too (Claessens and Djankov,

[22] Frydman *et al.* (1999) examine the performance from 1990 to 1993 of a panel of 218 privatized and state firms from the Czech Republic, Poland, and Hungary. It is certainly one of the most cited empirical paper on the impact of privatization because of two important contributions. First, the paper does an important effort of controlling for potential biases. They use a fixed effects model to control for bias caused by (unobserved) firm characteristics correlated with performance outcomes that are fixed over time. And they contrast the performance of firms privatized in one period with those privatized in another to compare the privatized firms with how they would have performed without privatization. Second, they show that while privatization improves performance, the effect is limited to certain measures of performance and cases where the state firm is sold to outside owners.

1999, Estrin and Rosevear, 1999). In some papers, the measurement of restructuring focuses directly on enterprise decisions: Grosfeld and Nivet (1999) consider investment rates, Estrin and Rosevear (1999) study changes in the structure of management and Djankov (1999) focuses on renovation of factories. While these studies are quite revealing, they only provide a partial picture, because they never cover all the countries. There are two dozen transition economies, and none of these papers deals with both Central and Eastern Europe and countries of the FSU. The reasons are the high cost of firm survey data collection in so many countries and the little uniformity regarding the way to define and classify such data, especially for measures of performance.[23]

Zinnes *et al.* (2001) highlight that a natural, if imperfect, alternative to complement the firm-level studies is to consider macroeconomic econometric evidence of gains from privatization. Furthermore, in transition economies, privatization has been an institutional large-scale policy reform and there was agreement on the goal of an economy dominated by private ownership. A healthy macroeconomic empirical literature exists on the relative importance of initial conditions, macroeconomic stabilization and liberalization on growth or output recovery.[24] However, there is little macroeconomic econometric evidence on the effects of privatization. Zinnes *et al.* (2001) have tried to fill this gap. They include in a panel data regression an indicator which captures the depth of privatization in order to explain the behavior of output. They show that privatization does not have a significant impact, unless the budget constraint is hard enough and the legal and institutional framework permits owners to control their firms.

[23] To our knowledge, there are only Carlin *et al.* (2001) that deal with ownership and restructuring in both Central and Eastern Europe and the FSU. Because of the compatibility issues involved in collecting accounting data from such a wide variety of countries, they rely for their dependent variables on responses to questionnaires. They focus on changes in real sales and employment, as well as a measure of product restructuring (that includes upgrading of existing products, introduction of new products, opening of new plants, and quality accreditation). They do not find a direct effect of change in ownership on sales growth. Nevertheless, they find an effect of privatization on product restructuring. And new product restructuring directly increases sales, so there is an indirect effect of ownership.

[24] Important contributions are, e.g., Berg *et al.* (1999), De Melo *et al.* (1996, 2001), Falcetti *et al.* (2002), Fischer *et al.* (1996a,b), Havrylyshyn *et al.* (1998) and Hernández-Catá (1997).

While ZES consider the importance of the strength of the institutional governance regime to empower owners, we do so through the lens of methods of privatization. As previously said, in early transition debates there was agreement on the goal of an economy dominated by private ownership, but conflicting views on how best to attain this. These views have given in practice different privatization policies. In an econometric setting close to the macroeconomic empirical literature on trajectories in transition economies (Falcetti *et al.*, 2002, Hernández-Catá, 1997 and Zinnes *et al.*, 2001), we first show that privatization *per se* does not generate macroeconomic performance gains. This result confirms the work of Zinnes *et al.* (2001). Then, we consider the role of the dominant privatization method implemented (gradual sales, massive giveaways or management employee buy out -MEBO-). We show that privatization by gradual sales always has a positive and significant impact on macroeconomic performance. On the contrary, privatization by massive giveaways has no impact.

Why are massive giveaways so bad? A comparison between our results and those of Zinnes *et al.* (2001) gives a simple and appealing answer to this question. Zinnes *et al.* (2001) find that privatization has no impact if the corporate governance and the budget constraint are soft. Thus it would mean that gradual sales are concomitant with a HBC and a strong government control of management contrary to massive giveaways.

Claiming that the problem with firms privatized *via* massive giveaways is a SBC syndrome is appealing. However, despite considerable progress in the last decade to give theoretical explanations to the soft budget syndrome, empirical research on its determinants is still in its infancy (Djankov and Murrell, 2002, Kornai *et al.*, 2003, Roland, 2000). The foremost difficulty is in operationalizing the notion of softness. In line with the works of Kornai, an empirical measure has to capture the expectations of managers to be bailed out in case of trouble. Thus, SBC theorists argue that, for example, subsidization of loss-making firms is not identical to SBC. Qian and Roland (1998, p.1143) remark that subsidization of loss-making enterprises

is sometimes an indicator of SBC. However, subsidies are not identical to SBC. There are cases in which firms receive subsidies but do not expect to be bailed out in cases of bad financial performance.[25] Furthermore, as we previously said, a number of empirical surveys confirm that loans have become the main mean of softening the budget constraint in several countries.

Consequently, **chapter 3** is an empirical chapter that studies if firms which obtain a loan expect their bank to extend the term of their loan if they fall behind in their bank repayments. Thus, we are close to the line of research initiated by Dewatripont and Maskin (1995) which considers that the SBC syndrome occurs when a funding source cannot commit to keep an enterprise to a fixed initial budget and/or to maintain the timing of repayment specified by the contract. To our knowledge, only Anderson *et al.* (2000) directly measure managers' expectations. They focus on the expectations of managers concerning state aid in case of financial difficulties by investigating a data set of 200 Mongolian firms. However they do not consider soft budgets as the extension of a credit when the firm falls behind in its bank repayments. The data used in this chapter are drawn from the Business Environment and Enterprise Performance Survey (BEEPS) 2002. We find that managers' expectations to have an extension of the term of their loan in case of trouble are higher for big firms and for firms owned by employees (in the CIS countries). We also show that self-reported measures of beliefs reflect an important element of reality: we provide evidence that a firm which believes it will be rescued in case of trouble becomes less responsive to the prices of its inputs.

The line of research on the SBC initiated by Dewatripont and Maskin (1995) is very interesting because a large part of soft budget phenomena can be understood in terms of the *ex ante/ex post* distinction, broadly constructed. For example, if a

[25] Earle and Estrin (2003) is one example among others (see Djankov and Murrell, 2002, p.770 for other examples). They use data for Russian enterprises during 1990 to 1994. They construct a measure of government assistance to enterprises which includes some channels of government support, such as federal subsidies, tax benefits, preferential credits, extra-budgetary funds, tax exemptions and local government subsidies. We do not know in their study if firms that receive government support behave differently and the analysis does not capture the financial distress of the enterprise, making the results difficult to compare with the theories of soft budgets.

private bank is presumably in the business of maximizing profit, it is not the case of a state-owned bank. A state bank is controlled by the government and, therefore, its financing and refinancing decisions reflect the government's objectives (political or social welfare objectives). The fact that Brana *et al.* (1999) in Russia and Coricelli and Djankov (2001) in Romania find that chronic loss-making enterprises receive more bank credit than do the other enterprises can be explained if the bank is state-owned. But profit-making enterprises have been confronted to credit rationing despite of a boom in the number of private banks in these countries, especially in the FSU. Marin *et al.* (2000, pp.216-217) argue that it is this lack of liquidity, and not tax reasons, that was the main motivation behind the explosive increase of barter during the nineties. However, it is very surprising given that these transition economies have appeared to be in a trap of continual budgetary pressures and high taxation.

Chapter 4 explains that if the lack of liquidity is an important problem for firms in the FSU, except for firms in trouble, it is because of a high tax rate. More precisely, we argue that banks lend only to some firms, because of the government's use of fiscal means to support these firms that have a SBC. In the model of Dewatripont and Maskin (1995), a bank might have an intrinsic interest in refinancing a poor project and it will do so if it has enough liquidity. By contrast, in the framework of chapter 4, the banks have no intrinsic interest in refinancing. It is the government that has an interest *ex post* in keeping some firms that are unprofitable afloat. Our model captures the idea that the government serves as an insurance company for the firms that have a SBC (i.e. that are rescued by the government in case of trouble). Thus, the banks might prefer *ex ante* to finance the firms that have a SBC. It is particularly the case when an important part of the verifiable output of a good project obtained by a firm is taxed by the government. The higher the tax rate, the higher the marginal return of its effort a firm has to concede, and the lesser the incentives to search for good projects. So if the tax rate is too high, the banks' alternative opportunity might give a higher expected payoff than the investment

in the projects of firms. Firms with a SBC, however, might be less confronted to this problem because the government serves as an insurance. The economic mechanisms highlighted in the model are tested in an empirical study with data drawn from BEEPS 2005 (also known as BEEPS III). In a first step, we consider which firms are more likely to obtain subsidies in case of trouble. We especially find that these ones are state-owned and members of lobbies. Estimation of this enables us to derive a predicted probability of receiving subsidies in case of trouble. This predicted probability, as well as other variables suggested by our theory such as the tax rate that a representative firm has to pay, are used as explanatory variables in an econometric model of loan selection. After controlling for a variety of micro and macro determinants of the probability of obtaining a loan, we continue to find highly statistically significant effect and quantitatively important positive effect of the probability of obtaining subsidies and important negative effect of the tax rate (or alternatively subsidies in percent of GDP). Not surprisingly, robustness checks show that the negative impact of tax rates is especially important in the countries of the FSU.

Chapter 2

Privatization and output behavior during the transition: Is János Kornai right?[1]

2.1 Introduction

The process of privatization in the former communist countries has generated a considerable microeconometric literature.[2] Nevertheless, in transition economies, privatization is an institutional large-scale policy reform and there is agreement that privatization will have a positive impact on the economy's output level, if not on its rate of growth. A healthy macroeconomic empirical literature exists on the relative importance of initial conditions, macroeconomic stabilization and liberalization on growth or output recovery.[3] However, Sheshinski and López-Calva (2003) indicate that little macroeconometric evidence exists on the effects of privatization. In the

[1] This chapter is based on Gouret F. (2007), "Privatization and output behavior during the transition: Methods matter!", *Journal of Comparative Economics*, vol.35: pp.3-34.

[2] Djankov and Murrell (2002) apply meta-analysis techniques to summarize this literature. Some important papers are presented at the beginning of subsection 1.3 in the general introduction of this thesis.

[3] For brevity, throughout this chapter, MEL stands for this literature. Important contributions are, e.g., Berg *et al.* (1999), De Melo *et al.* (1996, 2001), Falcetti *et al.* (2002), Fischer *et al.* (1996a,b), Havrylyshyn *et al.* (1998) and Hernández-Catá (1997).

best of the case, an EBRD privatization indicator is included in an aggregate liberalization index constructed as a weighted average of other EBRD transition indicators like price and trade liberalization.

This chapter contributes to the literature on transition by seeking to clarify what methods of privatization contributed, at the macro level, to the gains from privatization. Economists, in their majority, support an economic system dominated by private ownership. However, this broad agreement does not resolve what method has to be used to privatize. The debate which opposed partisans of massive giveaways (Lipton and Sachs, 1990b, e.g.,), and partisans of gradual sales (Kornai, 1990b, e.g.,), at the beginning of transition, led in practice to different privatization policies. Some countries adopted fast giveaways to outsiders or insiders as did the Czech Republic and Russia, respectively; others used MEBO to sell their small and medium enterprises (e.g., Slovenia), or favored sales to outsiders (e.g., Hungary). Ten years after *The Road to a Free Economy* (1990), Kornai (2000) argues that in concern with ownership reform, he was right. Comparing Hungary and Poland on the one hand, and the Czech Republic and Russia on the other hand, he highlights that a strategy of privatization through gradual sales is the best way to privatize existing assets. The strategy of mass privatization is inferior at best and expressly harmful at worst. Enough data are now available to examine econometrically if Kornai is right.

Two closely related papers are Zinnes *et al.* (2001) and Bennett *et al.* (2004a,b). Zinnes *et al.* (2001) use an econometric setting close to the MEL and include an indicator which captures the process of privatization to explain the behavior of output. They show that privatization does not have a significant impact, unless the budget constraint is hard enough and the legal and institutional framework permits owners to control their firms. While they consider the importance of the strength of the institutional governance regime to empower owners, we do so through the lens of methods of privatization. Bennett *et al.* (2004a,b) investigate the impact of different privatization methods in a panel data of 23 transition economies over the

period 1990-2001. Their most striking result is that countries which apply massive giveaways as a primary privatization method have a higher annual growth rate than those which use gradual sales.

This result as well as the explanations provided contrast with the stylized facts of the transition experience. Given the example of the Czech Republic, BEMU (2004a, p.24) claim that the distribution of shares at nominal cost to the general public led to shares being placed in the hands of privatization funds, which exerted pressure on managers to be relatively efficient. In fact, Glaeser *et al.* (2001) show that in the Czech Republic the privatization program has turned out to be disappointing because the institutional governance regime to empower owners was weak. Note that Bennett *et al.* (2004a, Table 8) themselves find that countries which apply massive giveaways as a primary privatization method have a lower annual growth rate than those which use gradual sales when they consider only non-CIS countries.

In fact, Bennett *et al.* (2004a,b) derive their results from a cross-country growth model along the line of Mankiw *et al.* (1992) relating annual growth rate to factor inputs. This approach is certainly a valuable approach, given that a small strand of the empirical literature worth mentioning discusses the growth prospects for economies in transition using this model. Using this approach, Fischer *et al.* (1998) study the process of convergence of Central European countries to low-income European Union countries like Greece and Portugal. The EBRD *Transition Report* of 1997 also follows this method to show that the level of institutional development can hamper convergence. However, it contrasts with the MEL which prefers to explain the growth process by reforms and stabilization.[4]

In an econometric setting close to the MEL, this chapter reports contrary results to those of Bennett *et al.* (2004a,b). We first find that privatization through gradual sales always has a positive impact on output level. On the other hand, privatization through massive giveaways has no impact. Second, it seems that dominant

[4] The MEL assumes, implicitly, or explicitly, like Fischer *et al.* (1996a) and Havrylyshyn (2001), that as far as countries have not experienced enough structural reforms and stabilization, the basic economic growth equation with neo-classical determinants is inadequate.

privatization methods leading to a permanent change in the ownership structure of the economy have different effects on output levels but not on annual growth rates. Indeed results obtained in a cross country growth model relating annual growth rate to factor inputs are very sensitive to the inclusion/exclusion of *proxies* for macroeconomic stabilization and reforms like price and trade liberalization.

The rest of the chapter is organized as follows. Section 2.2 summarizes the policy debate which has opposed partisans of massive giveaways to partisans of gradual sales. In section 2.3, we introduce our methodology and our database. Section 2.4 proceeds to examine econometrically how privatization affects the output behavior according to the primary privatization method implemented. Section 2.5 provides explanations of why our results and those of Bennett *et al.* (2004a,b) differ. Finally, section 2.6 offers a summary of the findings of the chapter.

2.2 The theory of privatization

Privatization is widely considered as an important centerpiece of the process of transition in the former communist countries. The theoretical literature argues that public ownership suffers serious efficiency losses because of agency problems and political interference in the management of firms.

First, agency problems occur when the manager maximizes his own utility function but not that of the owners of the firm. The problem of separation of ownership and control also exists in the modern capitalist corporation. Nevertheless, a state-owned enterprise is not traded on a market, so it is impossible to use market value as an indicator of good or bad management. It is the main reason of the inability of the state to monitor enterprise managers. And the reforms undertaken during the socialist era, which consisted in delegating control rights from ministries to the management of firms, could not have functioned because managers did not internalize the consequences of their actions as Kornai (1992) highlights.

Second, politicians have a tendency to distort managerial objectives to satisfy

political objectives, especially excess employment. On the one hand, politicians care about votes of people whose jobs are in danger and lobbies. On the other hand, the cost to the politician of distorting firms' objectives away from profit maximization is low: the cost of a bail out is easily spread across groups of tax payers, which are less organized groups than unions. Consequently, politicians do not internalize the cost of distorting managerial objectives as Boycko *et al.* (1996) highlight.

Economists, in their majority, support an economic system dominated by private ownership. Despite this broad agreement, an important debate has opposed partisans of massive giveaways (e.g., Lipton and Sachs, 1990b) to partisans of economic efficiency and revenue maximization through gradual sales (e.g., Kornai, 1990a, Murrell, 1995) or sales against noncash bids (e.g., Bolton and Roland, 1992).[5]

For Kornai (1990a, 2000), the inefficiency of state firms is due to the separation of ownership and control. Thus preference must be given to sales schemes that produce an ownership with a clear dominant owner. He emphasizes the role of entrepreneurs who risk personal financial losses. Therefore the transfer should be done at market price organized through sale auctions. The buyer can be an insider, but he has to pay a genuine price. It means that privatization cannot be allowed to degenerate into a form of giveaway. With sales, assets go to people with a real ownership behavior. When state firms can be restructured in order to be sold, a preprivatization restructuring has to be done. The latter serves as a screening device in order to attract private investors as Roland (2000) discusses. Indeed, private investors acquire the firms where the quality of assets yields positive expected returns. But firms should not be sustained artificially. If they have negative value, so unsaleable, they have to be liquidated.

Partisans of mass privatization have used different arguments to justify massive giveaways. First, Lipton and Sachs (1990b) argue that a standard technique of transfer may take millennia for two reasons. On the one hand, the private wealth is limited in transition economies. On the other hand, a costly preprivatization

[5] A noncash sale includes payment against credit or leasing contract.

restructuring would be necessary in too many cases to attract strategic investors. Thus, coupons could accelerate the process.

Second, partisans of mass privatization believe that privatization means the ending of subsidies, which drain state finances. Lipton and Sachs (1990b) consider that it is due to the inability of the state to monitor managers. For Boycko *et al.* (1996), this SBC syndrome is due to self-interested politicians who want to satisfy their constituencies.[6]

Third, other partisans of massive giveaways invoked the Coase theorem to claim that the question of how to privatize was irrelevant. Thus massive giveaways could be implemented. The basic concept is that it does not matter if the initial allocation of legal entitlements, like the Russian mass privatization to insiders, is inefficient. An efficient allocation will ultimately appear, regardless of how the property rights are allocated. Nevertheless, this result has not occurred because the existence of both well defined and enforceable property rights, the exchange on a perfectly competitive market and bargaining between parties without cost, are necessary conditions which are still not fulfilled in some transition economies. For example in Russia the renegotiation and recontracting of the allocation of property rights were blocked by powerful interest groups, because *de facto* regulatory and legal institutions responsible for shareholder protection did not developed. Without these regulatory and legal institutions supporting ownership, owners do not have the power to exercise their prerogatives of ownership and control as Pistor (2001) discusses.

Let's note that Lipton and Sachs (1990b) have been conscious that free distribution leads to a dispersed shareholding. So mass privatization proposals to outsiders have proposed intermediaries between citizens and firms to concentrate the shareholding. As Nivet (2001) points out, the controversies revolved around the precise form of these intermediaries, e.g., holdings or mutual funds, and the way they had to be created, i.e. by the state or spontaneously. Launched in 1992, the Czech Privati-

[6] In a nutshell, partisans of mass privatization believe that privatization was a sufficient condition to harden the budget constraint. For Kornai (2001) a dominant role for the private sector is a necessary condition for a HBC but not a sufficient one.

zation Program is a typical example of spontaneous creation of intermediaries. The Czech Program was initially designed in a way that would lead to dispersed ownership. However, coupons were concentrated afterwards in Investment Funds. Various Funds were launched by big state-owned banks. Consequently, Kornai (2001) highlights that this privatization has not permitted to sever the umbilical cord between the firms and the state because the state, through the banking system, was the ultimate purchaser of the privatizing assets.

2.3 Empirical approach and data description

Our database covers the period from 1990 to 2001 and includes the 25 countries usually used in the MEL.[7]

Our main dependent variable is $IGDP$, an index of real GDP relative to 1989, so that the value for each country is 100 in 1989. Therefore, the index gives the degree of economic recovery by showing the percent of pretransition GDP attained in the year t, like Hernández-Catá (1997) and Zinnes *et al.* (2001). To construct this variable, we use annual GDP growth rates from EBRD (2002b). This approach differs from some papers of the MEL (e.g., Falcetti *et al.*, 2002 and Fischer *et al.*, 1996a) as well as Bennett *et al.* (2004a,b), which use the annual growth rate and not growth since 1989 as a left-hand side variable. Two reasons motivate our choice. First, Berg *et al.* (1999) argue that an index of real output has to be used because of the time-series properties of the data.[8] Second, the MEL existing on the relative importance of

[7] The 25 countries are Albania, Armenia, Azerbaijan, Belarus, Bulgaria, Croatia, the Czech Republic, Estonia, Georgia, Hungary, the Kyrgyz Republic, Latvia, Lithuania, Kazakhstan, Macedonia, Moldova, Poland, Romania, Russia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

[8] They assume that the right-hand side policy variables are stationary, as they presumably evolve toward some international standard defined by market economies. Thus, if output is I(1), changes in stationary policy variables have permanent effects on growth. Nevertheless, if output is I(0) the left-hand side variable should be the level of output. The Dickey-Fuller test permits to reject the unit root in half of the countries considered. Considering the t-bar test statistic of Im *et al.* (2003), which is a panel unit root test based on the Dickey-Fuller statistics averaged across the countries, they also reject the unit root null hypothesis. Thus they define the endogenous variable as the output level. However, these tests have extremely weak power in short time series. So, we give more importance to the second argument that follows.

initial conditions, macroeconomic stabilization and liberalization on growth takes an *ad hoc* approach to specification. An important exception is Hernández-Catá (1997) who derives a structural form from first principles. He starts with a standard production function with a new and an old sector.[9] Liberalization increases the share of the new sector. At the end, his right-hand-side variables have no inputs, but instead policy variables like other studies. However, his left-hand side variable is the degree of output recovery.

An important objection to $IGDP$ is that it is based on calendar time. However, years of beginning of transition are different from a country to another. That is why various authors prefer to use a data set based on what they call transition time. Following Falcetti *et al.* (2002), it is a data set in which the first year for each country is the year when the break with the past political regime occurred. Thus, we will also consider $IGDPTRY$ an index of real GDP relative to the pretransition output, i.e. the output obtained during the ultimate year of the past political regime, with a data set only based on transition time.[10]

Using fixed effects model estimations with the data sets based on calendar or transition time will control for selection bias only to the extent that the unobserved characteristics correlated with the right-hand side variables are constant over time. However, most of the countries implement a clear privatization policies until two or three years after the beginning of transition. In the meanwhile, different factors might occur which can potentially influence the choice and the implementation of a privatization policy. For instance, it is possible that some countries chose mass privatization because they had deeper output declines prior to their choice; countries

[9] Campos and Coricelli (2002) and Havrylyshyn (2001) assimilate the new and the old sector of Hernández-Catá (1997) to the private and the state sector. This assimilation goes too far because ownership does not appear explicitly neither implicitly in the work of Hernández-Catá (1997). The unique conclusion that can be drawn from Hernández-Catá (1997) is that the new sector is roughly 2.6 to 3.6 times more productive than the old sector. However, we do not know if the old and the new sector are the state and the private sector, respectively.

[10] Transition has begun in 1990 in Bulgaria, the Czech Republic, Hungary, Poland, Romania and Slovakia; in 1991 in Albania, Croatia, Macedonia and Slovenia; in 1992 in Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, the Kyrgyz Republic, Lithuania, Latvia, Moldova, Russia, Ukraine, Tajikistan, Turkmenistan and Uzbekistan.

might also wait the amelioration of the legal and regulatory institutions supporting ownership prior the implementation of gradual sales. To deal with this problem, we use a third data set which begins for each country the year when a dominant privatization method had been implemented. In analogy with the data set based on transition time, we say that this data set is based on privatization time.[11] The dependent variable, $IGDPPRY$, is an index of real GDP relative to the year prior the dominant privatization method was implemented.[12]

Concerning explanatory variables, we can not take advantage of the indicators developed in Sachs *et al.* (2000) and used by Zinnes *et al.* (2001) which especially includes an indicator of change-of-title (COT). We construct an indicator $Priv$ which aims to capture the privatization *stricto sensu*, like COT. $Priv$ includes three EBRD indicators: the large scale privatization index, LSP, the small scale privatization index, SSP, and the private sector share of GDP, PSG.[13] To generate our indicator $Priv$, we proceed the following steps. First, to aggregate these three indexes, they need to be on the same scale. LSP and SSP comes from 1 to 4.33. PSG is in percent. Thus we rescale these three indicators between 0 and 1. Second, we compute the simple average of the sum of the three rescaled indicators to obtain $Priv$. As a result, $Priv$ covers the value between 0 and 1. Tables 2.1 and 2.2 present the five countries with the highest value and the five countries with the lowest value of $Priv$ for some selected calendar and transition years. These Tables

[11] Privatization is widely considered as the centerpiece of the process of transition in the former communist countries. Thus it is as if our preferred definition of transition time is based one the year in which a clear privatization policy is implemented.

[12] Contrary to the data sets based on calendar time and transition time, we do not balance the data set based on privatization time because Azerbaijan began its privatization policy only in 1996. Consequently, a balanced panel will imply a data set of only 5 years for each country. However, we have considered such a panel data set and results are qualitatively identical to those presented in the next section.

[13] Note that Zinnes *et al.* (2001) distinguish between the privatization *stricto sensu*, i.e. COT, and the depth of privatization. The depth of privatization is broken in two components, COT and $OBCA$. Our $Priv$ indicator is broadly identical to COT. COT includes LSP, SSP and PSG and two others sub-index that we do not have for all the series: the private sector employment share and the percentage of all small firms privatized. $OBCA$ is composed of additional important factors identified by the literature: institutions to address agency issues, hardening of the budget constraints, market competition as well as developing institutions and a regulatory framework to support them. O is for the firm's objectives, BC is for the firm's budget constraint, and A is for the agency problem.

reflect the effects of privatization. In 1990, the countries with the highest indicator of privatization were Poland, Hungary and some countries of the Former Yugoslavia. Extensive small-scale private trade and service activity existed in these countries. If we look at the classification based on transition time, one sees that Hungary and Slovenia disappear off the classification for the first and fifth years of transition. Hungary favored gradual sales to outsiders.[14] Concerning Slovenia, it did not have a very active privatization policy. It is also interesting to look at the Russian case. Russia had one of the lowest level in 1990. However, considering transition years, it had one of the highest level for its first and fifth years of transition, because Russia implemented a fast voucher scheme in 1992, its first year of transition.

Table 2.1: Countries with the 5 highest and the 5 lowest *Priv* by calendar time

	1990	1995	2001
Highest	Poland (0.3)	Czech Republic (0.83)	Czech Republic (0.89)
	Croatia (0.15)	Estonia (0.81)	Hungary (0.89)
	FYR Macedonia (0.15)	Hungary (0.77)	Slovakia (0.89)
	Slovenia (0.15)	Lithuania (0.71)	Estonia (0.88)
	Hungary (0.08)	Slovakia (0.70)	Poland (0.81)
Lowest	Albania (0.016)	Uzbekistan (0.52)	Tajikistan (0.55)
	Belarus (0.016)	Azerbaijan (0.48)	Azerbaijan (0.53)
	Kazakhstan (0.016)	Tajikistan (0.40)	Uzbekistan (0.52)
	Kyrghyz Republic (0.016)	Turkmenistan (0.25)	Turkmenistan (0.18)
	Russia (0.016)	Belarus (0.16)	Belarus (0.16)

Note: i. The levels of *Priv* are reported after the countries.

Alternatively, we use an indicator, *Pbis*, which only includes *LSP* and *SSP* for the following reason. *LSP* and *SSP* measure the amount of privatization of existing assets, while *PSG* measures the size of the private sector. It means that the latter also includes the de novo sector. Consequently, a privatization is counted twice, once through *LSP* or *SSP* and once as the privatization increases the size of the private sector. Such double counting does not occur for the privatization from below, which only enters once and directly into *Priv*. Consequently, we also consider *Pbis* as an

[14] However, Hungary had the highest level of *Priv* in 2001 and the second if we consider the tenth year of transition.

Table 2.2: Countries with the 5 highest and 5 lowest $Priv$ by transition time

	1	5	10
Highest	Lithuania (0.33)	Estonia (0.86)	Czech Republic (0.89)
	Poland (0.30)	Czech Republic (0.81)	Hungary (0.88)
	Latvia (0.28)	Lithuania (0.81)	Estonia (0.88)
	Russia (0.28)	Latvia (0.73)	Slovakia (0.88)
	Croatia (0.26)	Russia (0.70)	Lithuania (0.79)
Lowest	Bulgaria (0.03)	Bulgaria (0.33)	Tajikistan (0.55)
	Moldova (0.03)	Tajikistan (0.33)	Azerbaijan (0.53)
	Turmenistan (0.03)	Azerbaijan (0.18)	Uzbekistan (0.52)
	Ukraine (0.03)	Belarus (0.13)	Turkmenistan (0.18)
	Uzbekistan (0.03)	Turkmenistan (0.13)	Belarus (0.16)

Note: i. The levels of $Priv$ are reported after the countries.

indicator of change-of-title. As robustness tests, we also replicate the specifications using the PSG variable.

For the dominant privatization methods, we follow the EBRD classification which distinguishes vouchers, MEBO and gradual sales to outsiders. These three dominant privatization methods correspond to our three vectors $MASS$, $MEBO$ and VEN, respectively (see Table 2.A1 in Appendix). We use the EBRD reports (1994, 1996, 1997, 1998, 1999, 1999, 2000, 2001, 2002a) to construct these vectors. The EBRD has provided the primary privatization method since the Transition Report of 1998. For the period of 1990-1997, the data are manually collected from the country assessments of preceding Transition Report (1994, 1996, 1997).[15] Our privatization dummies have both a cross-section and a time dimension. Indeed, the primary privatization method may change during the transition process. For example, Slovakia began its privatization policy with massive giveaways.[16] A first wave, launched in 1992, was completed in 1993. A second wave, launched in 1994, was canceled in 1995. Privatization continued *via* MEBO. Finally, the dominant privatization method has

[15] Note that Garibaldi et al. (2001) propose a classification of dominant privatization methods by year. Two main differences exist with our classification. First we propose dominant privatization methods since the beginning of transition. Second they include MEBO and massive giveaways to insiders in the same category whereas we include massive giveaways to insiders in the same category than massive giveaways to outsiders.

[16] In 1992, Slovakia was still a part of Czechoslovakia.

been sales since 1998. As we mentioned previously, some countries have no primary privatization method during initial years, despite a growing $Priv$ variable.[17] It occurs in 47 observations when our regressions are based on calendar time, i.e. 15% of the database; in 23 observations when our regressions are based on transition time, i.e. 9% of the database. We could include these few points, corresponding to an undetermined privatization method, in one of the three categories cited above. However, it would be misleading to give an interpretation to their sign and their statistical significance. Consequently, we also introduce UND, a vector of the undetermined privatization method.

Our classification is broadly consistent with Bennett *et al.* (2004a,b). We reconcile some differences on the method used in particular countries. First, for Latvia, Bennett *et al.* (2004a,b) have considered that the primary dominant method has been sales since 1992. However, between 1994 and 1998, the EBRD (1998, p.177) reports the vouchers as the primary method. Second, for Poland, we identify MEBO, instead of direct sales, as the primary method from 1990 to 1994 which is consistent with Garibaldi *et al.* (2001, p.142). Third, we define a mass privatization for Slovakia between 1992 and 1994. For Azerbaijan, BEMU have considered that the primary dominant method has always been mass privatization since 1997. The EBRD reports that the primary privatization method is MEBO in 1996, the year when it began the small-scale privatization, mass privatization from 1997 to 2000, and sales for the year 2001. Finally, for Kazakhstan, the EBRD reports that the privatization method is massive giveaways from 1994 to 1998, and gradual sales after. Bennett *et al.* (2004a,b) consider that the dominant privatization method is gradual sales since 1996. Besides these marginal differences our main data seems to remain unchanged.

Table 2.3 provides descriptive statistics of the output recovery in function of primary privatization methods. Because the primary privatization method might have changed, we take for each country the most recurrent one during the transition

[17] For example, the Czech Republic began its mass privatization policy in 1992. Consequently, we do not have a privatization method for 1990 and 1991, like Garibaldi et al. (2001).

process. The Table shows that the countries with the best output recovery, whether in calendar time or transition time, are those which have followed essentially a strategy of privatization by gradual sales to outsiders. These basic descriptive statistics are no more than suggestive and we will see in the next section if the identified relationships hold in a multivariate analysis.

Table 2.3: Means of output recovery by primary privatization methods

Method	IGDP in 2001	IGDPTRY in $try = 10$
MASS	62.47	69.71
	(19.68)	(16.89)
MEBO	87.02	88.98
	(18.89)	(19.26)
VEN	107.31	107.28
	(16.61)	(10.39)

Notes: i. Standard deviations are reported below the means. ii. The first column is output recovery based on calendar time. The second column is output recovery based on transition time (try). Because of possible change in the primary privatization method during the transition process, we take for each country the most recurrent one.

In some regressions, we introduce $CFDI_{pc}$ which measures cumulative FDI per capita. We construct this variable using FDI, which is the net inflows of FDI, and $hbts$, which is the number of residents. These two variables are provided by the EBRD (2001, 2002a) and the World Bank (2003), respectively. Therefore, for the country i in the year t, $CFDI_{pc}$ is:

$$CFDI_{pc_{i,t}} = \sum_{T=1989}^{t} FDI_{i,T}/hbts_{i,t}$$

This variable serves as a control to ensure that privatization through gradual sales does not *proxy* for FDI. Table 2.4 shows that the countries with the highest level of $CFDI_{pc}$ are those which have followed a strategy of privatization by gradual sales to outsiders. Contrary to the local owners, they have the most up-to-date technology and have a crucial intangible asset: they know how a market economy functions which is not the case for the local entrepreneurs.

Table 2.4: Means of cumulative FDI per capita by primary privatization methods (US Dollars)

Method	$CFDI_{pc}$ in 2000
MASS	492.83
	(597.16)
MEBO	290.26
	(291.54)
VEN	4727,59
	(586,94)

Notes: i. Standard deviations are reported below the means.
ii. Because of possible change in the primary privatization method during the transition process, we take for each country the most recurrent one.

In order to ensure that our variables of interest do not *proxy* for other reforms, we also introduce the right-hand side variables used in the MEL. First, we develop an aggregate liberalization indicator, Ref, of the other reforms under way. Ref comprises 5 EBRD indexes: price liberalization, LP, trade liberalization, TL, banking sector reform, BR, competition policy, CP, and enterprise reform, ER. The sum of these 5 indexes is rescaled to have Ref included between 0 and 1. By introducing such an indicator, we follow, e.g., De Melo *et al.* (2001), Falcetti *et al.* (2002) or Merlevede (2003). Second, we consider a *proxy* for stabilization, $\ln(\pi)$, which is the natural logarithm of 1 plus the inflation rate in decimal, as do Fischer *et al.* (1996b).

We will control for country specific initial conditions using the cluster-fixed effects of Zinnes *et al.* (2001, p.151). They use different variables to assign countries to groups based on similarities at the start of transition.[18] Compared to a country-

[18] They identify twelve categories of initial conditions: physical geography, macroeconomics, demographics and health, trade and trade orientation, infrastructure, industrialization, wealth, human capital, market memory, physical capital, culture, and political situation. For a detailed of the key variables in each category, one might read Sachs *et al.* (2000, p.6). At the end, they obtain 7 clusters. Cluster 1 includes Croatia, the Czech Republic, Hungary, Poland, Slovakia and Slovenia; cluster 2 includes Estonia, Latvia, Lithuania; cluster 3 includes Bulgaria, Macedonia and Romania; cluster 4 is Albania; cluster 5 includes Belarus, Moldova, Russia and Ukraine; cluster 6 includes Armenia, Azerbaijan and Georgia; cluster 7 includes Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan.

fixed effects model, the cluster-fixed effects model is less costly in term of degrees of freedom.[19] However, cluster-fixed effects control for time-invariant characteristics only on the assumption that the countries within each cluster have similar characteristics and that all the relevant variables for the assignation of countries to clusters have been considered. If an unobserved characteristic influencing the macro performance is not related to the cluster, controlling for cluster-fixed effects is not enough to avoid possible selection bias. To eliminate possible doubts, we also use country-fixed effects.

2.4 Privatization and output behavior

In a first subsection, we briefly consider the impact of privatization on macroeconomic performance without taking account of how a country privatized. Despite having a slightly different database, we confirm the first results of Zinnes *et al.* (2001, pp.156-157): privatization *per se* does not seem to have a significant impact. Consequently, to explain this result we include in subsection 2.4.2 the dominant method of privatization.

2.4.1 Does privatization have an impact on macroeconomic performance?

We begin our analysis as do Zinnes *et al.* (2001). We place our indicator of privatization of the economy, $Priv$, without accounting for the privatization method used, in regressions with performance measures as dependent variables. We consider the following equation:

$$\begin{aligned} PERF_{i,t} &= C + \sum_{k} [\gamma_k CLUST(k)_i] + \beta_1 Priv_{i,t} \\ &+ \beta_2 Ref_{i,t} + \beta_3 \ln(\pi_{i,t}) + \beta_4 t + \beta_5 t^2 + \varepsilon_{i,t} \end{aligned} \tag{2.1}$$

[19] The country-fixed effects model implies to include a set of 24 dummy variables, considering that one is our base group to avoid the dummy variable trap, whereas the cluster fixed effects implies to include a set of 6 dummy variables.

where the i and t subscripts are for country and year, respectively. $PERF$ stands for our two measures of output recovery described in section 2.3, namely $IGDP$ and $IGDPTRY$. C is our constant. $\varepsilon_{i,t}$ is the regression's error term. Initial conditions appear through the cluster-fixed effects $CLUST(k)_i$. They are dummy variables for each of the clusters.[20] The uniform nonlinear time trend, t and t^2, is introduced to avoid possible spurious relations, since both output recovery and reforms follow a clear time pattern.

This equation is very similar to those of the MEL, especially the first one of Zinnes *et al.* (2001, p.156). We estimate it because our variables capturing the level of privatization, the other reforms under way and macroeconomic stabilization are slightly different.[21] Furthermore our data set includes more years.

Table 2.5 provides the regression estimates for the alternative specifications of equation 2.1. Successful macroeconomic stabilization seems to be necessary for economic recovery. Indeed, the estimator associated to $\ln(\pi)$ has the expected negative sign and is statistically different from zero across most specifications, though this effect is somewhat muted once we base our regression on transition time. The contemporaneous variable of liberalization is significant and has a negative sign, like Hernández-Catá (1997). It reflects the fact that the process of liberalization results into a large fall in output. The lagged effect is robustly beneficial for growth when we add it in columns [C] and [D]. However, the net benefit is weak: we do not obtain a J-curve effect, i.e. the absolute value of the lagged variable is statistically inferior to the absolute value of the contemporaneous variable. It confirms results found by Falcetti *et al.* (2002), who highlight the difficulty of finding, for the moment, a net benefit of reforms. However, an interesting point is that Zinnes *et al.* (2001) have a positive sign for their contemporaneous indicator of reform REF in most of their regressions. A possible explanation for this contrary result is that the

[20] $CLUST(k)_i$ is equal to one if country i belongs to cluster k and it is zero otherwise; Albania is our base group.

[21] In particular, they use a system of dummy variables to capture the impact of macroeconomic stabilization.

sign of the aggregate reform index is very sensitive to its individual components, as Radulescu and Barlow (2002) show. It seems to be confirmed by the results presented in column [E]. We have regressed equation 2.1 splitting Ref in two sub-indicators, EC and $Reflib$. EC includes ER and CP. This indicator is close to the $OBCA$ indicator of Zinnes *et al.* (2001) which reflects hardening of the budget constraints and market competition.[22] The other indicator, $Reflib$, comprises LP, TL and BR. It is close to the REF indicator of Zinnes *et al.* (2001) that also comprises a social safety net component and a tax reform component.[23] EC is significant and has a positive sign. $Reflib$ is significant but has a negative sign. It is possible that the positive sign obtained by Zinnes *et al.* (2001) is due to the inclusion of social safety nets and tax reform subcomponents. Such an argument is especially in line with Berkowitz and Li (2000) and Roland and Verdier (2003). They explain that the dramatic trajectories of Russia and Ukraine during the nineties are due to fiscal externalities, which are the results of malfunctioning tax administrations.

Finally, privatization does not seem to have a significant and positive impact in most of our regressions. This result confirms the work of Zinnes *et al.* (2001, p.157) who conclude that privatization *per se* is not enough to generate macroeconomic performance gains.

[22] Following the EBRD definition (1998, p.27), ER reflects the hardness of the budget constraint, i.e. the BC component of Zinnes *et al.* (2001). When $ER = 1$, it means that the budget constraint is still soft and that there are few reforms to promote corporate governance; $ER = 2$ means that there are moderately tight credit and subsidy policy but weak enforcement of bankruptcy legislation, and so on. CP reflects the importance of barriers to entry and abuse of market power: $CP = 1$ means that there is no competition legislation and institutions; $CP = 2$ means that there is a competition policy legislation and that institutions are set up, and so on.

[23] We cannot use indicators reflecting these components because we cannot take advantage of the panel data set developed by Sachs *et al.* (2000). The social safety net component was constructed entirely through the use of a survey data collected from the 25 transition countries for this purpose. Concerning the tax reform component, we never have all the series of indicators which can potentially reflect improvements in the tax code and in its administration.

Table 2.5: Does privatization *per se* generate macroeconomic performance gains?

	Estimations using calendar time					**Estimations using transition time**				
	[A] *IGDP*	[B] *IGDP*	[C] *IGDP*	[D] *IGDP*	[E] *IGDP*	[F] *IGDPTRY*	[G] *IGDPTRY*	[H] *IGDPTRY*	[I] *IGDPTRY*	[J] *IGDPTRY*
Cons	100.01***	111.56***	97.03***	113.27***	118.86***	91.78***	99.46***	92.26***	96.59***	105.12***
	(21.32)	(22.55)	(18.47)	(17.96)	(24.62)	(17.60)	(17.85)	(15.27)	(11.48)	(18.32)
Priv	11.62	11.79	1.24	-0.81	13.34	17.54**	9.37	16.32	7.94	12.31
	(1.32)	(1.28)	(0.12)	(-0.08)	(1.50)	(2)	(1.09)	(1.63)	(0.84)	(1.46)
Ref	-58.99***	-36.68***	-72.82***	-61.51***		-30.32**	-19.92*	-48.70***	-35.40**	
	(-4.92)	(-3.04)	(-4.68)	(-4.15)		(-2.44)	(-1.70)	(-2.99)	(-2.19)	
$Ref(-1)$			39.73***	46.02***				28.39*	16.42	
			(2.69)	(3.07)				(1.94)	(1.07)	
Reflib					-51.23***					-28.43***
					(-6.10)					(-3.31)
EC					34.16***					18.55**
					(3.66)					(1.97)
$\ln(\pi)$	-5.70***	-2.83**	-2.33*	-0.23	-2.17**	-0.01	0.88	-0.04	1.18	0 .80
	(-5.29)	(-2.54)	(-1.82)	(-0.19)	(-2.05)	(-0.01)	(0.70)	(-0.03)	(0.80)	(0.66)
t		-7.96***		-8.24***	-7.95***		-5.69***		-3.24	-6.31***
		(-5.22)		(-4.50)	(-5.52)		(-3.47)		(-1.38)	(-3.90)
t^2		0.58***		0 .60***	0.56***		0.60***		0.42***	0 .62***
		(5.94)		(5.34)	(6.05)		(4.83)		(2.46)	(5.07)
R^2	0.52	0.58	0.53	0.58	0.62	0.46	0.54	0.51	0.57	0.56
Obs.	300	300	275	275	300	250	250	225	225	250

Notes: i. The symbols *, ** and *** represent statistical significance at the 10%, 5% and 1% levels, respectively.
ii. t-statistics are reported under coefficient estimates.
iii. Cluster-fixed effects are included in all ten models but not reported.

2.4.2 Privatization policies matter

If we follow partisans of gradual sales, the results of the previous regressions may come as no surprise. Indeed the privatization policy implemented, i.e., gradual sales, massive giveaways or MEBO, might matter. To examine if the impact of privatization depends on the primary privatization method, we estimate the following equation:

$$\begin{aligned} PERF_{i,t} &= C + \sum_k [\gamma_k CLUST(k)_i] + \beta_1 Priv_{i,t} + \beta_2 Priv_{i,t} \times MASS_{i,t} \\ &+ \beta_3 Priv_{i,t} \times MEBO_{i,t} + \beta_4 Priv_{i,t} \times UND_{i,t} \\ &+ \beta_5 Ref_{i,t} + \beta_6 \ln(\pi_{i,t}) + \beta_7 t + \beta_8 t^2 + \varepsilon_{i,t} \end{aligned} \tag{2.2}$$

VEN does not appear in our regression because it is our base group. $Priv$ is interacted with the dominant privatization methods. By this way, we can test if the impact of $Priv$ depends on the primary privatization method.

Table 2.6 provides the regression estimates for the alternative specifications of equation 2.2. Results concerning stabilization and liberalization policies are broadly the same as in the preceding subsection.

To test the significance of the impact of privatization of the economy by the different privatization policies, we test linear combination of coefficients, except for gradual sales which is our base group.[24]

[24] For example, to test the impact of privatization when the dominant method of transfer is mass privatization, we test $\beta_1 + \beta_2 = 0$, where the subscripts of the coefficients are the same as in equation 2.2.

Table 2.6: The importance of the method of privatization

	Calendar time			**Transition time**			**Privatization time**		
	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]
	$IGDP$	$IGDP$	$IGDP$	$IGDPTRY$	$IGDPTRY$	$IGDPTRY$	$IGDPPRY$	$IGDPPRY$	$IGDPPRY$
$Cons$	100.16***	110.31***	109.33***	91.65***	100.29***	101.35***	105.74***	116.15***	116.76***
	(21.25)	(22.55)	(22.04)	(17.35)	(17.88)	(18.13)	(13.91)	(14.94)	(15.18)
$Priv$	31.57***	30.82***	27.87***	33.42***	24.83***	22.13**	28.50**	43.36***	38.17***
	(3.52)	(3.28)	(2.93)	(3.77)	(2.70)	(2.36)	(2.13)	(3.01)	(2.66)
$Priv \times MASS$	-25.04***	-22.56***	-18.30***	-22.92***	-18.44***	-14.44***	-28.69***	-29.52***	-21.21***
	(-6.58)	(-6.02)	(-4.44)	(-5.97)	(-4.82)	(-3.45)	(-5.42)	(-5.53)	(-3.68)
$Priv \times MEBO$	-15.81***	-10.10**	-3.81	-10.85**	-6.59*	-2.81	-24.84***	-21.09***	-9.02
	(-3.73)	(-2.40)	(-0.80)	(-2.46)	(-1.65)	(-0.61)	(-4.15)	(-3.56)	(-1.36)
$Priv \times UND$	7.30	-13.49	-6.53	-9.68	-18.56	-14.19	Dropped	Dropped	Dropped
	(0.33)	(-0.62)	(-0.31)	(-0.54)	(-1.07)	(-0.82)			
Ref	-64.72***	-39.64***	-40.02***	-35.84***	-22.59*	-20.66*	-25.09	-23.14	-26.54
	(-5.71)	(-3.33)	(-3.28)	(-3.00)	(-1.94)	(-1.74)	(-1.38)	(-1.31)	(-1.53)
$\ln(\pi)$	-6.05***	-3.52***	-3.85***	-0.78	-0.46	-0.62	-5.36***	-6.06***	-5.92***
	(-5.97)	(-3.28)	(-3.50)	(-0.68)	(-0.38)	(-0.51)	(-3.08)	(-3.46)	(-3.48)
$CFDI_{pc}$			0.01***			0.006			0.01***
			(3.40)			(1.54)			(3.75)
t		-7.83***	-8.08***		-6.22***	-7.02***		-8.03***	-9.30***
		(-5.04)	(-4.53)		(-3.79)	(-4.07)		(-4.10)	(-4.35)
t^2		0.53***	0.50***		0 .59***	0.63***		0.60***	0.62***
		(5.43)	(4.04)		(4.71)	(4.55)		(4.22)	(3.62)
R^2	0.58	0.62	0.64	0.53	0.58	0.60	0.44	0.48	0.51
Obs.	300	300	300	250	250	235	253	253	228

Notes: i. The symbols *, ** and *** represent statistical significance at the 10%, 5% and 1% levels, respectively.
ii. t-statistics are reported under coefficient estimates.
iii. Cluster-fixed effects are included in all models but not reported.

First, countries which adopt gradual sales to privatize their economy have the best impact of privatization on economic performance. This impact is significant and positive in all our specifications. Column [A] of Table 2.6 presents the equation estimates of equation 2.2 without the uniform quadratic time trend. The result shows a positive impact of privatization of the economy by gradual sales method on output recovery. When we introduce the uniform quadratic time trend in column [B], this impact is very similar. Column [C] includes cumulative FDI per capita. $Priv$ is still positive and statistically different from zero. However the $Priv$ estimator is reduced compared to column B. $CFDI_{pc}$ captures a part of the effect of privatization *via* gradual sales.

Second, privatization by massive giveaways has a lower impact than gradual sales. Indeed $Priv \times MASS$ is negative and statistically significant in all the specifications of Table 2.6. Testing for the impact of privatization when the dominant method of transfer is mass privatization, we conclude that there is no impact in all the specifications of Table 2.6.

Third, countries which privatize the economy by MEBO have an ambiguous impact of privatization as compared to gradual sales. Indeed, the impact of privatization by MEBO is lower than the impact of privatization by gradual sales, though the difference between these two methods is muted when we add cumulative FDI per capita whatever in calendar, transition or privatization time.[25] Indeed, in columns [C], [F] and [I], i.e. when we introduce cumulative FDI per capita, privatization by MEBO has the same impact as a privatization by gradual sales. The following interpretation is possible: privatization by MEBO and by gradual sales to local outsiders have the same positive impact on cumulative growth. However, privatization by sales to foreign investors has a higher impact than privatization by MEBO. Indeed, when we do not control for foreign investors, privatization to strategic foreign investors is

[25] If we test $\beta_1 + \beta_3 = 0$, where the subscripts of the coefficients are the same as in equation 2.2, we conclude that privatization by MEBO has a positive but lower impact than privatization by gradual sales in columns A and B for calendar time, columns D and E for transition time and columns G and H for privatization time. In columns C, F and I, the impact is obviously identical to a privatization by gradual sales.

captured in our base group and we see a higher positive impact when privatization is done by gradual sales to outsiders. When we introduce $CFDI_{pc}$, this variable captures privatization to strategic foreign investors. Consequently the estimator of $Priv$, even if statistically significant and positive, is reduced. The impact is positive because outsiders who acquire firms have a real ownership behavior. But the impact is identical to a MEBO because they suffer the same problem: they do not have the latest know-how.

It is also important to note that MEBO is usually a temporary dominant privatization method. MEBO has been the primary privatization method in countries that privatized quickly their small and medium firms. However, when it was time to privatize large firms, countries usually switched to another method. They switched from MEBO to gradual sales, like Poland[26], or from MEBO to massive giveaways, like Armenia, Georgia and Ukraine.[27] Countries where MEBO was still the dominant privatization method in 2001 were Croatia, Slovenia, Belarus, Tajikistan, Turkmenistan and Uzbekistan. Croatia and Slovenia did not have very active privatization policies. Concerning the four other countries, especially Belarus and Turkmenistan, they did not really begin the privatization process as shown in Table 2.1. The privatization of small firms by MEBO is perhaps less problematic than that of large firms because the smaller the firm, the lesser is the problem of free riding and the easier is the restructuring of the production process.

We also estimate regressions with the dominant privatization methods of existing assets without combining it with $Priv$. More precisely, we consider the following equation.

$$\begin{aligned} PERF_{i,t} &= C + \sum_k [\gamma_k CLUST(k)_i] + \beta_1 PSG_{i,t} + \beta_2 MASS_{i,t} + \beta_3 MEBO_{i,t} \\ &+ \beta_4 UND_{i,t} + \beta_5 Ref_{i,t} + \beta_6 \ln(\pi_{i,t}) + \beta_7 t + \beta_8 t^2 + \varepsilon_{i,t} \end{aligned} \tag{2.3}$$

[26] Note that Poland launched a programme of massive giveaways in 1995. Despite this flirt with a voucher scheme, it never became the dominant privatization method.

[27] In Ukraine, large scale privatization began officially in 1992, especially through MEBO and leasing to employees. However, the progress was slow. Thus, a presidential decree introduced in November 1994 a voucher-based mass privatization program.

In equation 2.3, we test a shift in intercept contrary to equation 2.2 in which we test a shift in slope. Following Bennett *et al.* (2004a,b), we introduce PSG that they consider as a *proxy* for the emergence of the new sector. Table 2.7 provides the regression estimates for the alternative specifications of equation 2.3. Results about stabilization and liberalization policies are broadly the same as in Table 2.6. VEN is our base group. Countries which implement massive giveaways always have lower macroeconomic performance than those which adopt gradual sales.

To check the robustness of these results, we repeated the regressions for various specifications, sub-samples and methods.

Table 2.7: Methods of privatization and macroeconomic performance gains without interaction with PSG

	Calendar time			**Transition time**			**Privatization time**		
	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]
	$IGDP$	$IGDP$	$IGDP$	$IGDPTRY$	$IGDPTRY$	$IGDPTRY$	$IGDPPRY$	$IGDPPRY$	$IGDPPRY$
$Cons$	89.73***	98.07***	96.81***	86.99***	96.67***	96.42***	116.85***	120.56***	117.53***
	(14.28)	(15.40)	(14.99)	(12.57)	(13.93)	(13.87)	(11.82)	(12.29)	(12.17)
PSG	44.67***	47.19***	44.21***	34.32***	26.74***	27.10***	6.4	26.57*	20.37
	(5.13)	(4.88)	(4.54)	(3.76)	(2.60)	(2.59)	(0.49)	(1.67)	(1.29)
$MASS$	-14.69***	-13.38***	-10.38***	-13.50***	-11.03***	-8.27***	-19.41***	-19.37***	-12.32***
	(-5.77)	(-5.34)	(-3.80)	(-5.14)	(-4.24)	(-2.95)	(-5.16)	(-5.23)	(-3.09)
$MEBO$	-6.22**	-3.03	-0.72	-4.74*	-2.63	-0.70	-15.03***	-10.92***	-4.37
	(-2.26)	(-1.09)	(-0.24)	(-1.66)	(-0.94)	(-0.24)	(-3.67)	(-2.58)	(-0.99)
UND	6.35	4.47	5.42	0.38	-1.41	0.40	Dropped	Dropped	Dropped
	(1.49)	(1.19)	(1.43)	(0.09)	(-0.35)	(0.10)			
Ref	-66.46***	-43.69***	-43.50***	-33.10***	-19.54*	-18.49*	-19.82	-11.01	-9.82
	(-6.89)	(-4.09)	(-3.92)	(-3.07)	(-1.82)	(-1.69)	(-1.21)	(-0.69)	(-0.62)
$CFDI_{pc}$			0 .01***			0.006*			0.01***
			(3.11)			(1.65)			(3.95)
$ln(\pi)$	-4.11***	-2.64**	-3.16***	-0.14	-0.27	-0.49	-4.91***	-5.66***	-5.63***
	(-4.13)	(-2.57)	(-3.00)	(-0.13)	(-0.22)	(-0.40)	(-2.78)	(-3.21)	(-3.29)
t		-6.99***	-6.90***		-6.27***	-6.97***		-8.52***	-9.18***
		(-4.44)	(-3.85)		(-3.64)	(-3.90)		(-4.09)	(-4.08)
t^2		0.45***	0.40***		0.57***	0 .60***		0.62***	0.61***
		(4.63)	(3.27)		(4.46)	(4.25)		(4.27)	(3.47)
R^2	0.62	0.65	0.66	0.54	0.58	0.60	0.43	0.47	0.50
Obs.	300	300	275	250	250	235	253	253	228

Notes: i. The symbols *, ** and *** represent statistical significance at the 10%, 5% and 1% levels, respectively.
ii. t-statistics are reported under coefficient estimates.
iii. Cluster-fixed effects are included in all models but not reported.

Table 2.8: Robustness checks

	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]	[K]
	IGDP	*IGDP*	*IGDPPRY*	*IGDPPRY*	*IGDP*	*IGDPPRY*	*IGDP*	*IGDP*	*IGDP*	*IGDP*	*IGDP*
Cons	133.0***	108.1***	111.02***	119.4***	128.0***	119.0***	111.69***	97.64***	111.7***	109.20***	109.5***
	(32.9)	(12.9)	(18.95)	(10.2)	(31.2)	(18.0)	(23.04)	(18.34)	(23.5)	(22.04)	(22.4)
Priv	30.46***	26.66***	23.04*	27.15**	26.33***	21.72*	18.17**	59.60***	32.44***	29.51***	28.81***
	(3.43)	(2.94)	(1.80)	(2.09)	(3.04)	(1.72)	(2.44)	(6.06)	(3.55)	(2.86)	(3.07)
$Pr \times MAS$	-25.30***	-25.33***	-23.67***	-22.25***	-23.83***	-23.37***	-20.51***	-25.37***	-18.19***	-22.11***	-21.10***
	(-6.38)	(-6.35)	(-4.43)	(-4.10)	(-6.16)	(-4.42)	(-5.82)	(-6.16)	(-4.89)	(-5.80)	(-5.65)
$Pr \times MEB$	-9.440**	-8.161*	-15.60***	-14.82**	-10.73**	-18.02***	-11.19***	-4.24	-3.838	-10.51**	-10.22**
	(-2.03)	(-1.74)	(-2.63)	(-2.45)	(-2.37)	(-3.03)	(-2.85)	(-0.89)	(-0.87)	(-2.48)	(-2.45)
$Pr \times UND$	0.958	-7.465	Dropped	Dropped	-1.390	Dropped	-30.62	23.29	-12.82	-8.84	-11.99
	(0.054)	(-0.41)			(-0.081)		(-1.60)	(1.21)	(-0.61)	-0.40	(-0.56)
Ref	-31.32***	-19.44	-34.43**	-32.52**			-30.14***	-49.26***	-41.64***	-43.70***	-38.58***
	(-2.87)	(-1.63)	(-2.54)	(-2.36)			(-2.59)	(-4.76)	(-3.54)	(-3.44)	(-3.24)
Reflib					-35.52***	-34.92***					
					(-4.72)	(-3.53)					
EC					24.68**	14.97					
					(2.50)	(1.17)					
$ln(\pi)$	-3.078***	-1.206	-1.71	-0.884	-2.678***	-1.665	-3.44***	-3.31***	-3.319***	-3.82***	-3.601***
	(-3.68)	(-1.10)	(-1.45)	(-0.71)	(-3.27)	(-1.43)	(-3.17)	(-3.22)	(-3.15)	(-3.43)	(-3.28)
t	-8.420***		-4.14***		-8.524***	-4.411***	-7.50***	-8.15***	-9.011***	-6.96***	-7.546***
	(-5.87)		(-2.64)		(-6.12)	(-2.83)	(-4.90)	(-5.36)	(-5.76)	(-4.33)	(-4.86)
t^2	0.569***		0.47***		0.562***	0.478***	0.53***	0.51***	0.597***	0.49***	0.528***
	(6.71)		(4.71)		(6.83)	(4.76)	(5.40)	(5.38)	(6.03)	(4.88)	(5.34)
R^2	0.80	0.81	0.81	0.82	0.81	0.82	0.62	0.65	0.63	0.62	0.63
Obs.	300	300	253	253	300	253	300	300	288	288	288
Notes	FE	FE DY	FE	FE DY	FE	FE	CFE Pbis instead of Priv	CFE PSG instead of Priv	CFE Poland excluded	CFE Russia excluded	CFE Ukraine excluded

Notes: i. The symbols *, ** and *** represent statistical significance at the 10%, 5% and 1% levels, respectively.
ii. t-statistics are reported under coefficient estimates.
iii. CFE and FE stand for cluster-fixed effects and country-fixed effects, respectively. DY stands for time specific effects (year dummies).
iv. Cluster 1 corresponds to Croatia, the Czech Republic, Hungary, Poland, Slovakia, Slovenia; Cluster 2: Estonia, Latvia, Lithuania; Cluster 3: Bulgaria, Macedonia, Romania; Cluster 4: Albania; Cluster 5: Belarus, Moldova, Russia, Ukraine; Cluster 6: Armenia, Azerbaijan, Georgia; Cluster 7: Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan, Uzbekistan.

Table 2.8: Robustness checks (concluded)

	[L] $IGDP$	[M] $IGDP$	[N] $IGDP$	[O] $IGDP$	[P] $IGDP$	[Q] $IGDP$	[R] $IGDP$	[S] $IGDPPRYEL$	[T] $IGDPPRYEL$
$Cons$	113.66***	109.44***	112.09***	101.80***	108.82***	108.37***	104.98***	109.89***	74.41***
	(24.12)	(20.90)	(21.30)	(27.30)	(22.29)	(21.30)	(21.06)	(19.30)	(12.28)
$Priv$	31.73***	34.40***	36.41***	28.26***	30.26***	28.78***	23.80**	33.70***	35.24***
	(3.27)	(3.20)	(3.45)	(3.01)	(2.86)	(2.79)	(2.58)	(2.62)	(2.70)
$Priv \times MASS$	-21.16***	-26.08***	-23.64***	-22.24***	-16.60***	-21.38***	-24.15***	-11.45**	-15.92***
	(-4.81)	(-5.52)	(-5.90)	(-6.03)	(-4.42)	(-5.37)	(-6.32)	(-2.16)	(-2.65)
$Priv \times MEBO$	3.57	-11.46**	-12.93***	-13.55***	-9.69**	-9.70**	-9.48**	-3.46	-1.03
	(0.64)	(-2.50)	(-2.59)	(-3.21)	(-2.37)	(-2.23)	(-2.16)	(-0.58)	(-0.16)
$Priv \times UND$	-9.67	-14.00	-15.93	-22.43	-0.43	-16.54	-8.29	Dropped	Dropped
	(-0.42)	(-0.55)	(-0.58)	(-1.05)	(-0.02)	(-0.74)	(-0.39)		
Ref	-47.45***	-36.55***	-45.84***	-40.87***	-30.31**	-35.35***	-42.79***	-28.51**	-28.60**
	(-3.78)	(-2.76)	(-3.42)	(-3.43)	(-2.32)	(-2.81)	(-3.34)	(-2.08)	(-2.03)
$Reflib$									
EC									
$ln(\pi)$	-3.44***	-3.50***	-3.46***	-3.73***	-3.81***	-2.32*	-4.42***	3.28***	3.96***
	(-3.32)	(-3.00)	(-2.95)	(-3.51)	(-3.25)	(-1.83)	(-3.70)	(2.74)	(3.02)
t	-9.58***	-8.01***	-8.21***	-7.53***	-8.46***	-7.74***	-5.32***	-1.82	-1.37
	(-6.12)	(-4.77)	(-4.80)	(-4.89)	(-4.96)	(-4.58)	(-2.92)	(-1.17)	(-0.84)
t^2	0.60***	0.53***	0.56***	0.51***	0 .58***	0.54***	0.41***	0.12	0.08
	(5.96)	(4.96)	(5.13)	(5.21)	(5.50)	(5.05)	(3.73)	(1.27)	(0.85)
R^2	0.65	0.61	0.63	0.64	0.62	0.54	0.67	0.85	0.86
Obs.	228	264	264	288	252	264	240	242	220
Notes	CFE Cluster 1 excluded	CFE Cluster 2 excluded	CFE Cluster 3 excluded	CFE Cluster 4 excluded	CFE Cluster 5 excluded	CFE Cluster 6 excluded	CFE Cluster 7 excluded	FE Total sample	FE Excluding Armenia & Kyrgyzy

Notes: i. The symbols *, ** and *** represent statistical significance at the 10%, 5% and 1% levels, respectively.
ii. t-statistics are reported under coefficient estimates.
iii. CFE and FE stand for cluster-fixed effects and country-fixed effects, respectively. DY stands for time specific effects (year dummies).
iv. Cluster 1 corresponds to Croatia, the Czech Republic, Hungary, Poland, Slovakia, Slovenia; Cluster 2: Estonia, Latvia, Lithuania; Cluster 3: Bulgaria, Macedonia, Romania; Cluster 4: Albania; Cluster 5: Belarus, Moldova, Russia, Ukraine; Cluster 6: Armenia, Azerbaijan, Georgia; Cluster 7: Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan, Uzbekistan.

We first estimate the same regressions replacing the cluster dummies by country dummies in columns [A] through [F] in Table 2.8.[28] The problem in the regressions of Tables 2.6 and 2.7 is that if an unobserved characteristic influencing the macro performance is not related to the cluster, controlling for cluster-type group fixed effects will not control for the resulting possible selection bias. Given the incredible number of variables used by Sachs *et al.* (2000) to assign countries to clusters based on similarities at the start of transition, we can easily think that the bias would be small for regressions based on calendar time. It is confirmed by equation estimates on the data set based on calendar time presented in columns [A] and [B] of Table 2.8. However, the results presented in Table 2.6 with the data set based on privatization time are more questionable because different events may have occurred between the beginning of transition and the implementation of a dominant privatization policy, like the output decline or the amelioration of the legal and regulatory institutions. These events are not taken into consideration to assign countries to clusters because they occur after the beginning of transition. However, all these events occurring prior the implementation of a dominant privatization policy are time-invariant for the sample based on privatization time. And if it is impossible to control for all possible factors without identifying them and checking for each one, country unobserved effects will span all these time invariant-variables for the sample based on privatization time. Columns [C] and [D] of Table 2.8 present the same regression estimates than columns A and B with the data set based on privatization time. The estimator of $Priv$ is reduced when we use country instead of cluster effects, but it is still statistically significant and positive. Note that in columns [B] and [D] the uniform quadratic time trend is replaced by year dummies. A system of year-dummies implies an important loss of degrees of freedom compared to the quadratic time trend. However, it is more flexible to take account of specific year-effects. Columns [E] and

[28] We have also tested that the constant terms are all equal with an F-test. Country-fixed effects or cluster-fixed effects are always globally significant. We have also regressed all the equations by random effects model which have given similar results. However, in most of the cases, a Hausman's test permits to conclude that random effects are not consistent.

[F] present results with country-fixed instead of cluster-fixed effects using the data sets based on calendar and privatization time but splitting the reform indicator.

Second, we estimate the same regressions replacing the *Priv* indicator by *Pbis* or *PSG*. Column [G] of Table 2.8 provides the regression estimates using *Pbis* instead of *Priv*. In column [H], we estimate the same regression with *PSG*.

Third, the dominant method of privatization may not be as clear as the EBRD classification indicates. For example, the dominant privatization method in Russia is massive giveaways since 1992 if we follow the EBRD classification. However, the World Bank (1996) and Dabrowski *et al.* (2001) consider the main privatization method in Russia as being MEBO because majority ownership passed into the hands of existing managers and employees. Thus, we test the sensitivity of our results, excluding one country or one cluster of countries at a time from the original sample of 25 countries. Column [J] of Table 2.8 excludes the observations for Russia. In columns [L] trough [R] we present results when we drop one cluster of countries at a time.

Fourth, data on GDP can lack precision in transition economies due to the substantial size in the informal sector. Hernández-Catá (1997), Johnson *et al.* (1997) and Kaufmann and Kaliberda (1996) suspect that the official national accounts in transition countries underestimate the output by a substantial margin. A simple and appealing *proxy* for overall output, official and unofficial, is electricity consumption, which is a good physical indicator of production. Electricity consumption and overall economic activity have been empirically observed to move in lock-step with an output elasticity of electricity close to one. However, the unit elasticity assumption for all countries can be criticized, especially in transition economies because the use of electricity is more efficient in Central European countries than in the FSU, or because there may be a shift of the output mix away from electricity intensive industries. To take account of these critics, we proceed like Johnson *et al.* (1997), i.e. we consider the Kaufmann and Kaliberda classification of *ex post* output elasticity for electricity consumption. They consider that the Central and Eastern

European countries have an output elasticity of electricity consumption of 0.9; the Baltic countries have a unitary elasticity; and the rest of the FSU has an elasticity of 1.15. The number for total GDP is derived by assuming that changes in electricity consumption corrected by the elasticity mentioned above equal changes in total GDP. Data on electricity consumption come from the World Development Indicators (2003). They are incomplete or missing for Croatia and Macedonia. Because there are missing values for countries of the FSU before 1992 and Johnson *et al.* (1997) consider that these elasticities are true when economies begin to grow again, we present the results with this correction applied to $IGDPPRY$. Column [S] presents the results with $IGDPPRYEL$, the corrected left-hand side variable. In column [T], we drop Armenia and the Kyrgyz Republic, as do Johnson *et al.* (1997, p.176), because of enormous disruptions in electricity generation and large shifts toward electricity consumption, respectively.

We also verify that our results do not change when we replace $Priv$, $Priv \times MEBO$ and $Priv \times MASS$ by one-year-lagged $Priv$, $Priv \times MEBO$ and $Priv \times MASS$. In all these cases, the two main conclusions cited above still hold: privatization of the economy by gradual sales to outsiders is the best way to privatize the economy, especially when outsiders are foreign investors. The privatization of the economy by massive giveaways has no impact or a positive but lower impact than the privatization by gradual sales. The difference between privatization by MEBO and gradual sales is often muted when we add cumulative FDI per capita.

The econometric setting in the previous Tables is very close to the MEL, i.e. like Berg *et al.* (1999), De Melo *et al.* (1996, 2001), Falcetti *et al.* (2002), Fischer *et al.* (1996a,b), Havrylyshyn *et al.* (1998), Hernández-Catá (1997), Heybey and Murrell (1999), Merlevede (2003) and Zinnes *et al.* (2001). Fischer *et al.* (1996a, p.232) and Havrylyshyn (2001, p.74) explicitly say that as far as countries have not experienced enough reforms and macroeconomic stabilization, the neo-classical determinants of growth are not important and the basic economic growth equations like those of Mankiw *et al.* (1992) or Levine and Renelt (1992) are not the adequate tool for

transition economies. However, Central and Eastern Europe have achieved macroeconomic stabilization and undertaken deeper reforms. Thus, factor inputs, i.e. the determinants of macroeconomic performance of typical market economies, should predominate, at least in these countries.[29] Not surprisingly, Fischer *et al.* (1998) themselves use models of macroeconomic performance related to factor inputs to study the process of convergence of Central and Eastern European countries, as well as the Baltics, to EU countries.

Consequently, Table 2.9 presents the estimation results of specifications with neo-classical determinants of growth as control variables. $\ln(L)$ is the logarithm of working-age population, where working-age is defined as 15 to 64, and $\ln(I/GDP)$ is the logarithm of investment as percent of GDP. Data are from the World Bank (2003) and the EBRD (1999, 2000, 2003), respectively. Data on investment share in GDP are particularly weak, varying considerably from one *Transition Report* to another in various countries for the years considered, as highlighted by Havrylyshyn *et al.* (1998, p.24).[30] In columns [A] through [E], we test a shift in slopes, as we did in Table 2.6. VEN is our base group. To avoid spurious relation, we introduce a system of year dummies. It is preferred to a nonlinear time trend because of numerous gaps in the data.

In columns [A] and [B] of Table 2.9, we control for $\ln(I/GDP)$ and $\ln(L)$. Countries adopting gradual sales have no impact of privatization whereas countries adopting massive giveaways have a negative impact of privatization.[31] In fact these results are driven by the inclusion of $\ln(I/GDP)$. Column [C] excludes this variable and results are the same as in Tables 2.6 and 2.8: privatization via gradual sales has

[29] For nearly two-third of the observations, the level of Ref is less than halfway between unreformed and full-fledged market economies and for 40% of the observations inflation is above 50%. However, countries for which the indicator of reform is more than 0.6 are the Czech Republic and Poland since 1993, Hungary and Slovakia since 1994, Estonia and Slovenia since 1997, Latvia since 1999 and Croatia and Lithuania since 2000.

[30] For example, the EBRD Transition Report of 1999 assigns for Kazakhstan a value of 14.6 to this ratio for the year 1992, while the one of 2000 assigns 30.4 for the same year. A high number of observations are concerned by this problem.

[31] We test if the sum of the coefficients of $Priv$ and $Priv \times MASS$ is equal to zero. We have to reject the null hypothesis at the 1% level.

a positive impact, and privatization *via* massive giveaways has no impact. In fact $\ln(I/GDP)$ is statistically correlated with $Priv \times VEN$ at the 5% level, the coefficient of correlation being 0.15 and the p-value 0.0174. On the other hand, it is not correlated with $Priv \times MASS$, the coefficient of correlation being 0.02 and the p-value 0.67. It suggests that the impact of investment on macro performance depends on the type of ownership, i.e. the dominant method of privatization. Consequently, column [D] presents a regression in which $\ln(I/GDP)$ is interacted with dominant privatization methods. Again, VEN is our base group. The impact of investment largely depends on the dominant privatization method: investment has the largest impact when the dominant privatization method is gradual sales. In column [E], we interact both $\ln(I/GDP)$ and $Priv$ with dominant privatization methods. Privatization *via* gradual sales has a positive impact. Privatization *via* massive giveaways has no impact. However there is no more difference in the impact of investment. This is due to the high level of multicollinearity which inflates the variance of the estimators of $\ln(I/GDP) \times MASS$ and $\ln(I/GDP) \times MEBO$.[32]

In columns [F] and [G] of Table 2.9, we test a shift in intercept, as we did in Table 2.7: countries which adopt massive giveaways always have lower macro performance than those which adopt gradual sales.

[32] The variance inflation factors of these two estimators are 45.10 and 45.52, respectively.

Table 2.9: Alternative frameworks: Controlling for the working-age population and the investment share in GDP

	[A]	[B]	[C]	[D]	[E]	[F]	[G]
	$IGDP$	$IGDP$	$IGDP$	$IGDP$	$IGDP$	$IGDP$	$IGDP$
$Cons$	-899.4***	-775.6***	265.4	-966.4***	-932.1***	-905.1***	-715.7***
	(-4.09)	(-3.39)	(0.80)	(-4.24)	(-4.05)	(-3.99)	(-3.06)
$Priv$	-3.626	-3.058	25.85***		15.37*		
	(-0.48)	(0.34)	(2.75)		(1.72)		
$Priv \times MASS$	-23.72***	-22.92***	-25.06***		-30.97***		
	(-6.44)	(-5.73)	(-5.41)		(-4.03)		
$Priv \times MEBO$	-14.83***	-14.11***	-7.697		-28.53***		
	(-3.16)	(-2.90)	(-1.23)		(-3.36)		
$Priv \times UND$	-24.21	-12.12	-6.318		-87.16***		
	(-1.38)	(-0.67)	(-0.28)		(-3.87)		
PSG						-0.0800	0.0241
						(-0.74)	(0.20)
$MASS$						-15.20***	-13.99***
						(-6.15)	(-5.55)
$MEBO$						-8.927***	-9.171***
						(-2.89)	(-3.10)
UND						-0.979	-0.232
						(-0.29)	(-0.070)
$\ln(L)$	68.35***	59.84***	-10.20	73.93***	71.62***	70.23***	56.57***
	(4.31)	(3.64)	(-0.57)	(4.52)	(4.35)	(4.31)	(3.38)
$\ln\left(\frac{I}{GDP}\right)$	9.479***	9.730***		11.86***	5.080**	9.193***	9.631***
	(5.02)	(5.30)		(5.65)	(2.03)	(4.79)	(5.10)
$\ln\left(\frac{I}{GDP}\right) \times MASS$				-4.926***	2.170		
				(-6.16)	(1.24)		
$\ln\left(\frac{I}{GDP}\right) \times MEBO$				-2.834***	2.974		
				(-2.80)	(1.55)		
$\ln\left(\frac{I}{GDP}\right) \times UND$				-0.405	7.006***		
				(-0.39)	(4.00)		
Ref		-23.17**	-21.87*				-30.88**
		(-2.10)	(-1.68)				(-2.57)
$ln(\pi)$		-1.461	-1.310				-1.148
		(-1.22)	(-0.97)				(-1.08)
Obs.	275	275	300	275	275	275	275
R^2	0.87	0.88	0.81	0.87	0.88	0.87	0.88

Notes: i. The symbols *, ** and *** represent statistical significance at the 10%, 5% and 1% levels, respectively.
ii. t-statistics are reported under coefficient estimates.
iii. Country-fixed effects as well as year effects are included in all models but not reported.

Our chapter and the article of Zinnes *et al.* (2001) are in line with the economic mechanisms expressed by Dabrowski *et al.* (2001), Kornai (2000, 2001) or Roland (2000). Furthermore, these economic mechanisms permit to support and complement the results of Zinnes *et al.* (2001). They find that privatization has no impact if a set of institutional structures is not in place. Their indicator of institutional development, $OBCA$, aims to capture the quality of corporate governance and the hardness of the budget constraint. Thus it would mean that gradual sales are concomitant with a HBC and a strong government control of management contrary to massive giveaways. It is true that gradual sales necessitate preprivatization restructuring to attract strategic investors. Examples of Hungary and Poland are revealing. In Hungary, the Hungarian State Property Agency firmly reestablished its control to avoid waste. Consequently it targeted strategic foreign investors. In Poland, state managers began to restructure when budget constraints became harder due to the slowdown of subsidies as Aghion and Blanchard (1994) and Dabrowski *et al.* (2001) discuss. In these two countries, Kornai (2001) argues that privatization *via* bankruptcy and liquidation of unviable state firms played a big role. On the other hand, massive giveaways seem to be linked with poor corporate control of management and SBC. Examples of the Czech Republic and Russia are also revealing to explain why. As mentioned previously, in the Czech Republic, some Funds, in which coupons were concentrated afterwards, were launched by state-owned banks which bailed out unrestructured firms. In Russia policymakers gave away ownership and control of old firms to managers to lean on them for supporting reforms; thus, it was difficult for the Russian government not to give subsidies to managers: the political capital that the government obtained by given away ownership to them would have been lost.

2.5 Output versus annual growth rate

If our results, like those of Zinnes *et al.* (2001), are in line with the transition experience, we have not explained why they are so different with Bennett *et al.* (2004a,b). There are two methodological differences between our work and the one of Bennett *et al.* (2004a,b). First, they use annual growth rate as a left-hand side variable. Second, their approach is to estimate a cross-country growth model along the line of Mankiw *et al.* (1992). They supplement the standard model relating annual GDP growth to annual change in employment and annual change in investment with indicator of private sector development, privatization method and capital market development. However, contrary to the MEL, Bennett *et al.* (2004a,b) do not consider the role of macroeconomic stabilization and reforms.

Section 2.3 provides an argument in favor of an index of real output. Following Hernández-Catá (1997), we might derive a structural form from first principles and obtain an indicator of output recovery explained by policy variables like the regressions of the preceding section. An implication of this framework is that reforms which lead to a permanent change in, e.g., the openness or the ownership structure of the economy will have a permanent effect on output levels, but not on how output continues to evolve after transition. As mentioned in section 2.3, the MEL with annual growth rate takes an *ad hoc* approach to specification. Nevertheless, one might think that reforms leading to permanent change in the openness or the ownership structure of the economy have permanent effect on annual growth rates. As highlighted by Berg *et al.* (1999, p.12), this is a natural assumption which has some backing in the empirical growth literature. Furthermore, the fact that a part of the MEL (e.g., Falcetti *et al.*, 2002 and Merlevede, 2003) model the output dynamics of transition in terms of growth rather than output level argues in trying growth as an endogenous variable in a MEL framework. Table 2.10 provides the regression estimates for the alternative specifications. VEN is our base group. In column [A], the results obtained previously in Table 2.7, with an index of real GDP as a left-

hand side variable, are apparently not valid. In fact, it seems that this first result is driven by countries belonging to the cluster 6, i.e. the three countries of Caucasus: Armenia, Azerbaijan and Georgia. It is a cluster of influential observations in the sense that the deletion of this cluster leads to a drastic change in the coefficient. Indeed, in columns [B] through [H], we estimate the same regression than in column [A] by dropping one cluster of countries at a time. In column [G], when we drop cluster 6, results are identical to those previously found with an index of real GDP: countries which adopt massive giveaways have lower annual growth rate than those which adopt gradual sales. One can argue that Hungary and Poland, or all countries belonging to the cluster 1, are perhaps influential observations too working in the other sense. It is hardly defendable given the results obtained in column [B] when we drop cluster 1. To avoid any doubts, column [I] proposes a regression estimate excluding countries belonging to cluster 6 and Hungary and Poland. In column [J], we exclude countries belonging to clusters 6 and 1. Again, countries which implement massive giveaways have lower annual growth rate than those which implement gradual sales. Lastly, column [K] proposes a regression estimates excluding countries belonging to clusters 6 and 7 because some observations concerning countries of these clusters are outliers. On the one hand, Armenia in 1992, Azerbaijan in 1993, Georgia in 1992 and 1993 and Tajikistan in 1992 are lower outliers.[33] On the other hand, even if there are no upper-outliers, observation with the highest annual growth rates, say above 10%, are Armenia in 2001, Azerbaijan in 1998 and 2000, Georgia in 1996 and 1997, as well as Kazakhstan and Tajikistan in 2001, Turkmenistan in 1999, 2000 and 2001 and Belarus in 1997. With the exception of Belarus, all these countries belong to cluster 6 or cluster 7. Results in column [K] are identical to those in columns [G], [I] and [J].

[33] An observation is considered to be a lower outlier if $Growth_{i,t} < Q_l - 1.5 \times IQR$ and an upper outlier if $Growth_{i,t} > Q_u + 1.5 \times IQR$, with Q_l and Q_u the lower and upper quartile and $IQR = Q_u - Q_l$ the inter quartile range. In our data set $Q_u = 4.75$, $Q_l = -7.15$ and $IQR = 11.9$. Thus an observation is a lower outlier if $Growth_{i,t} < -25\%$ and an upper outlier if $Growth_{i,t} > 22\%$. The growth rate of Georgia in 1992, -44.8%, is even a lower far-outlier, i.e. $-44.8\% < Q_l - 3 \times IQR$.

Table 2.10: The importance of the method of privatization with *Growth* as a left-hand side variable

	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]	[K]
	Growth	*Growth*	*Growth*	*Growth*	*Growth*	*Growth*	*Growth*	*Growth*	*Growth*	*Growth*	*Growth*
Cons	-6.03**	-6.20*	-7.47**	-6.32*	-3.29	-8.37***	-8.04***	-6.13	-6.62*	-7.50**	-7.84***
	(-2.40)	(-1.65)	(-2.42)	(-1.94)	(-1.28)	(-2.66)	(-2.98)	(-1.16)	(-1.82)	(-2.04)	(-3.04)
PSG	3.50	2.14	1.4	5.1	0.04	8.22	7	2.5	5	4,99	8.34*
	(0.58)	(0.29)	(0.22)	(0.82)	(0.01)	(1.12)	(1.20)	(0.38)	(0.91)	(0.70)	(1.70)
MASS	-0.72	-1.30	0 .003	-0.78	-0.68	0.35	-1.88**	-0.94	-2.08*	-2.79**	-2.48**
	(-0.80)	(-1.10)	(0.00)	(-0.88)	(-0.76)	(0.36)	(-2.13)	(-0.95)	(-1.95)	(-2.24)	(-2.56)
MEBO	-1.08	-2.92	-0.88	-0.73	-1.89	-1.43	0 .17	-0.33	-0.68	-1.26	1.44
	(-0.82)	(-1.48)	(-0.66)	(-0.46)	(-1.50)	(-1.08)	(0.14)	(-0.22)	(-0.43)	(-0.64)	(1.09)
UND	-2.53	-3.45	-2.04	-3.09	-3.68*	-2.09	0.45	-3.86	-0.09	0.11	-0.40
	(-1.34)	(-1.16)	(-0.82)	(-1.14)	(-1.75)	(-0.85)	(0.19)	(-1.49)	(-0.04)	(0.04)	(-0.15)
Ref	-12.24**	-14.14**	-10.93*	-14.18**	-13.85**	-12.14*	-10.17**	-11.41*	-11.17*	-10.62	-8.39
	(-2.04)	(-1.96)	(-1.67)	(-2.13)	(-2.31)	(-1.82)	(-1.69)	(-1.69)	(-1.81)	(-1.50)	(-1.49)
$\ln(\pi)$	-5.44***	-5.26***	-5.07***	-5.71***	-5.58***	-5.28***	-5.40***	-5.50***	-5.35***	-5.23***	-5.52***
	(-6.95)	(-6.06)	(-6.46)	(-6.59)	(-7.22)	(-5.65)	(-7.88)	(-5.81)	(-7.54)	(-6.74)	(-8.71)
t	2.79***	2.80***	2.77***	2.72***	2.86***	2.76***	2.41***	3.15***	2.50***	2.36**	2.39***
	(3.38)	(2.71)	(3.17)	(3.13)	(3.53)	(2.83)	(3.17)	(3.45)	(2.75)	(2.44)	(2.66)
t^2	-0.12***	-0.10*	-0.11**	-0.11**	-0.11**	-0.13**	-0.10**	-0.15***	-0.10**	-0.08	-0.12**
	(-2.59)	(-1.94)	(-2.32)	(-2.33)	(-2.54)	(-2.55)	(-2.41)	(-3.04)	(-1.98)	(-1.39)	(-2.27)
R^2	0.56	0.57	0.54	0.58	0.58	0.57	0.58	0.57	0.57	0.58	0.59
Obs.	300	228	264	264	288	252	264	240	240	192	204
$\beta_1 = \beta_2$ (p-val.)	0.401	0.26	0.99	0.34	0.45	0.78	0.029**	0.33	0.046**	0.024**	0.009***
Notes	All Sample	Cluster 1 excluded	Cluster 2 excluded	Cluster 3 excluded	Cluster 4 excluded	cluster 5 excluded	Cluster 6 excluded	Cluster 7 excluded	Cluster 6, Hungary and Poland excluded	Cluster 6 and 1 excluded	Cluster 6 and 7 excluded

Notes: i. The symbols *, ** and *** represent statistical significance at the 10%, 5% and 1% levels, respectively.
ii. t-statistics are reported under coefficient estimates.
iii. Cluster-fixed effects are included in all models but not reported.
iv. Cluster 1 corresponds to Croatia, the Czech Republic, Hungary, Poland, Slovakia, Slovenia; Cluster 2: Estonia, Latvia, Lithuania; Cluster 3: Bulgaria, Macedonia, Romania; Cluster 4: Albania; Cluster 5: Belarus, Moldova, Russia, Ukraine; Cluster 6: Armenia, Azerbaijan, Georgia; Cluster 7: Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan, Uzbekistan.
v. The line $\beta_1 = \beta_2$ provides the p-value corresponding to the F-stat on the equality of the coefficients of *MASS* and *PSG*.

Note that if the PSG variable was significant in columns [G], [I], [J] and [K], one could have argued that both the privatization methods and the share of private businesses were sharing the same information. They could have been statistically equal. However, both PSG and $MASS$ variables entail different information. In the specifications of table 2.10, the PSG variable alone is not significant. Thus, the share of private businesses does not influence the annual growth rate. We argue that the different methods of privatization do. $MASS$ is statistically different from zero and negative in specifications [G], [I], [J] and [K] of Table 2.10. It means that countries which adopt massive giveaways have a lower annual growth rate than our base group, i.e. gradual sales. To assess the validity of this argument, we run several F-tests of equality between the coefficients on PSG and $MASS$. The line $\beta_1 = \beta_2$ in Table 2.10 presents the p-value of the F-statistics for each specification. The test of their equality is rejected at least at the 5% level in columns [G], [I], [J] and [K] meaning that they are statistically different from one another.

These results seem different with Bennett *et al.* (2004a,b) but they are not. When Bennett *et al.* (2004a, Table 8) consider only non-CIS countries, they find that countries which apply massive giveaways have lower annual growth rates than those which apply gradual sales. In fact, results obtained in columns [G], [I] and [J] indicate that the results they obtain when they consider the entire sample may be driven by countries of Caucasus.

Nevertheless, at least two questions are still unanswered. First, we do not find, contrary to Bennett *et al.* (2004a,b), that countries which have implemented massive giveaways have a higher annual growth rate when we consider all the sample. Thus, the control variables used in a growth regression, an indicator of reforms and a *proxy* for stabilization in the MEL or traditional factor inputs like Bennett *et al.* (2004a,b) might matter. Second, the results of Table 2.10 might not be robust if we use country instead of cluster-fixed effects, or if we use a data set based on privatization time instead of calendar time.

Consequently, we have estimated a cross-country growth model along the line

of Bennett *et al.* (2004a,b), controlling for change in investment and change in employment. Following these authors, we use the EBRD Transition Reports which provide $\Delta empl$, i.e. the percentage change in employment. Like $\frac{I}{GDP}$, defined in the preceding section, data on percentage change in employment are particularly weak, varying considerably from one Transition Report to another in various countries for the years considered.[34]

Column [A] of Table 2.11 presents a regression close to BEMU.[35] To avoid spurious relation, we introduce a system of year dummies. It is preferred to a nonlinear time trend because of numerous gaps in the data. And we control for unobserved characteristics with country-fixed effects, as do Bennett *et al.* (2004a,b).

In column [A] of Table 2.11, results are close to those of Bennett *et al.* (2004a,b): countries which implement massive giveaways have higher annual growth rate than those which implement gradual sales.

To check the robustness of this result, we first introduce $\ln(\pi)$ and Ref in column [B]. $MASS$ is no more significant. Column [C] proposes regression estimates excluding $\Delta empl$ and $\Delta\frac{I}{GDP}$. This regression is close to regression [A] of Table 2.10, except that it controls for country instead of cluster-fixed effects.

As robustness checks, we also estimate the same regressions than [A], [B] and [C], by dropping one cluster of countries at a time from the original sample. Columns [D] through [X] present most of the results. These columns report results without $\Delta empl$ and $\Delta\frac{I}{GDP}$ only if changes are important. $MASS$ is significant and positive when we exclude clusters 2, 3, 4, 5 or 7 and do not control for Ref and $\ln(\pi)$. But when we control for the level of reforms and stabilization, i.e. in columns [G], [I], [K], [M] and [S], $MASS$ is no more significant. Note that when we exclude cluster

[34] For some countries, the EBRD (1999, p.281; 2003, p.211) provides percentage change in employment and for others percentage change in employment in industry, e.g., for Ukraine. Sometimes for the same series, it varies considerably from one EBRD Report to another and some years are unavailable.

[35] Note that Bennett *et al.* (2004a,b) also introduce the stock market capitalization as a share in GDP in their regressions. When we introduce this variable, results obtained in column A of table 2.11 do not hold. Furthermore, this variable is unavailable for 149 observations in the EBRD Transition Reports for our data set and we suppose 127 observations in the BEMU data set in which Turkmenistan and Tajikistan are excluded.

6, i.e. countries of Caucasus, $MASS$ is not significant whatever the specification.

At least two conclusions might be drawn from Table 2.11 and one from the comparison of Tables 2.10 and 2.11 with Tables 2.6, 2.7 and 2.8. First, controlling for stabilization and reforms changes the results drastically when the left-hand side variable is annual growth rate. Second, our results are very sensitive to the left-hand side variable used. On the one hand, our results and those of Zinnes *et al.* (2001) permit to show that privatization through massive giveaways always has a lower impact on output levels. On the other hand, it is very difficult to find that a method of privatization has a permanent effect on annual growth rates. These two results are not contradictory. It might mean that methods of privatization leading to a permanent change in the ownership structure of the economy have different effects on the output level, but not on the annual growth rate. Given that we have utilized a variety of econometric specifications, we feel that this interpretation is the appropriate one.

Table 2.11: The importance of the method of privatization with *Growth* as a left-hand side variable and controlling for the variations of inputs variables

	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]	[K]	[L]
	Growth	*Growth*	*Growth*	*Growth*	*Growth*	*Growth*	*Growth*	*Growth*	*Growth*	*Growth*	*Growth*	*Growth*
Cons	-4.20	0.80	13.76***	11.28	9.727	14.25**	16.64***	13.66**	16.13**	8.77**	16.80***	11.56*
	(-0.76)	(0.16)	(3.35)	(1.64)	(1.49)	(2.22)	(2.77)	(2.06)	(2.57)	(2.25)	(6.01)	(1.67)
PSG	5.9	1.9	6.9	-3.3	-4.62	3.09	-0.50	5.93	3.25	5.68	-4.12	17
	(0.62)	(0.21)	(0.97)	(-0.35)	(-0.45)	(0.30)	(-0.05)	(0.60)	(0.34)	(0.59)	(-0.56)	(1.53)
MASS	3.74**	2.14	1.74	0.56	0.23	4.38**	2.73	3.43*	2	3.73**	2.15	4.31**
	(1.99)	(1.20)	(1.24)	(0.21)	(0.09)	(2.02)	(1.34)	(1.94)	(1.17)	(1.98)	(1.21)	(2.34)
MEBO	-3.21	-2.78	-2.54	-7.72**	-7.08*	-2.89	-2.66	-2.52	-2.08	-3.17	-2.74	-4.59*
	(-1.31)	(-1.24)	(-1.28)	(-2.15)	(-1.94)	(-1.15)	(-1.19)	(-0.93)	(-0.86)	(-1.29)	(-1.22)	(-1.84)
UND	-2.85	-1.26	-0.33	-5.29	-4.16	-1.90	-0.60	-4.52	-3.32	-2.86	-1.26	-5.08
	(-0.69)	(-0.34)	(-0.14)	(-1.08)	(-0.95)	(-0.48)	(-0.16)	(-0.91)	(-0.72)	(-0.69)	(-0.34)	(-1.19)
$\Delta empl$	0.25*	0.23		0.180	0.17	0.24	0.21	0.28*	0.28 *	0.25**	0.23	0.45***
	(1.71)	(1.50)		(1.03)	(0.93)	(1.46)	(1.24)	(1.75)	(1.67)	(1.71)	(1.50)	(3.51)
$\Delta \frac{I}{GDP}$	4.29**	3.53**		4.11**	3.65**	5.81***	4.80***	3.94**	4.40**	3.64**	3.99**	3.884**
	(2.51)	(1.99)		(2.45)	(2.12)	(3.61)	(2.70)	(2.36)	(1.71)	(2.56)	(2.05)	(2.18)
$\ln(\pi)$		-4.50***	-5.09***		-2.90**		-4.34***		-4.40***		-4.49***	
		(-4.07)	(-6.01)		(-2.21)		(-3.99)		(-3.29)		(-4.07)	
Ref		-10.37	-11.91*		-8.09		-9.09		-13.28		-10.46	
		(-1.27)	(-1.86)		(-0.86)		(-1.08)		(-1.54)		(-1.28)	
R^2	0.63	0.68	0.65	0.68	0.70	0.62	0.68	0.66	0.70	0.63	0.68	0.66
Obs.	240	240	300	179	179	212	212	207	207	234	234	199
$\beta_1 = \beta_2$	0.051*	0.235	0.232	0.82	0.90	0.04**	0.18	0.056*	0.24	0.052*	0.23	0.026**
Notes	All sample	All sample	All sample	Cluster 1 excluded	Cluster 1 excluded	Cluster 2 excluded	Cluster 2 excluded	Cluster 3 excluded	Cluster 3 excluded	Cluster 4 excluded	Cluster 4 excluded	Cluster 5 excluded

Notes: i. The symbols *, ** and *** represent statistical significance at the 10%, 5% and 1% levels, respectively.
ii. t-statistics are reported under coefficient estimates.
iii. Country-fixed effects and dummy year effects are included in all models but not reported.
iv. Cluster 1 corresponds to Croatia, the Czech Republic, Hungary, Poland, Slovakia, Slovenia; Cluster 2: Estonia, Latvia, Lithuania; Cluster 3: Bulgaria, Macedonia, Romania; Cluster 4: Albania; Cluster 5: Belarus, Moldova, Russia, Ukraine; Cluster 6: Armenia, Azerbaijan, Georgia; Cluster 7: Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan, Uzbekistan.
v. The line $\beta_1 = \beta_2$ provides the p-value corresponding to the F-stat on the equality of the coefficients of $MASS$ and PSG.

Table 2.11: The importance of the method of privatization with *Growth* as a left-hand side variable and controlling for the variations of inputs variables (concluded)

	[M] *Growth*	[N] *Growth*	[O] *Growth*	[P] *Growth*	[Q] *Growth*	[R] *Growth*	[S] *Growth*	[T] *Growth*	[U] *Growth*	[V] *Growth*	[W] *Growth*	[X] *Growth*
$Cons$	11.92**	7.38	7.13	14.90**	11.74***	8.27	15.38***	-6.49	-0.22	6.90	3.27	9.61
	(2.31)	(1.64)	(1.02)	(2.44)	(3.14)	(1.61)	(3.13)	(-1.09)	(-0.04)	(1.02)	(0.36)	(1.25)
PSG	7.34	10.17	15.29	9.58	12*	-2.79	-3.44	6.44	1.07	9.15	4.05	7.38
	(0.70)	(1.25)	(1.60)	(1.18)	(1.79)	(-0.25)	(-0.32)	(0.68)	(0.11)	(0.98)	(0.34)	(0.76)
$MASS$	2.80	2.71*	2.38	0.10	-0.28	4.81**	2.48	-2.33	-3.45	-2.23	3.23	-1.32
	(1.59)	(1.77)	(1.20)	(0.06)	(-0.20)	(2.18)	(1.13)	(-1.58)	(-1.39)	(-1.45)	(1.33)	(-1.36)
$MEBO$	-3.89*	-3.31	-1.24	-2.21	-1.47	-2.23	-1.57	-7.51**	-8.52***	-4.42	1.05	-0.33
	(-1.72)	(-1.65)	(-0.59)	(-1.16)	(-0.84)	(-0.82)	(-0.63)	(-2.12)	(-2.64)	(-1.54)	(0.47)	(-0.15)
UND	-3.45	-1.59	1.79	3.06	2.75	-3.75	-1.75	-2.18	-1.68	1.90	1.29	3.35
	(-0.37)	(-0.63)	(0.40)	(0.79)	(1.11)	(-0.80)	(-0.42)	(-0.42)	(-0.39)	(0.56)	(0.25)	(0.73)
$\Delta empl$	0.42***		0.179	0.074		0.17	0.16	-0.065	-0.087		-0.030	-0.03
	(3.06)		(1.58)	(0.56)		(1.01)	(0.90)	(-0.38)	(-0.54)		(-0.17)	(-0.25)
$\Delta \frac{I}{GDP}$	3.16*		2.082	2.18		4.82**	3.84*	1.75	2.00		0.83	1.53
	(1.70)		(0.84)	(1.02)		(2.02)	(1.68)	(0.81)	(0.97)		(0.20)	(0.44)
$\ln(\pi)$	-3.80***	-4.93***		-6.04***	-5.88***		-4.76***		-4.977***	-5.43***		-6.89***
	(-2.97)	(-5.33)		(-7.24)	(-8.86)		(-3.71)		(-5.21)	(-6.43)		(-6.74)
Ref	-3.15	-12.17		-11.37	-12.15*		-12.95		-10.69	-10.19		-13.83*
	(-0.28)	(-1.57)		(-1.56)	(-1.99)		(-1.34)		(-1.25)	(-1.34)		(-1.72)
R^2	0.70	0.65	0.58	0.69	0.64	0.62	0.68	0.65	0.71	0.68	0.57	0.71
Obs.	199	252	211	211	264	198	198	150	150	192	169	169
$\beta_1 = \beta_2$	0.12	0.08*	0.26	0.99	0.56	0.03**	0.25	0.40	0.16	0.17	0.19	0.63
Notes	cluster 5 excluded	Cluster 5 excluded	Cluster 6 excluded	Cluster 6 excluded	Cluster 6 excluded	Cluster 7 excluded	Cluster 7 excluded	Clusters 1 and 6 excluded	Clusters 1 and 6 excluded	Clusters 1 and 6 excluded	Clusters 6 and 7 excluded	Clusters 6 and 7 excluded

Notes: i. The symbols *, ** and *** represent statistical significance at the 10%, 5% and 1% levels, respectively.
ii. t-statistics are reported under coefficient estimates.
iii. Country-fixed effects and dummy year effects are included in all models but not reported.
iv. Cluster 1 corresponds to Croatia, the Czech Republic, Hungary, Poland, Slovakia, Slovenia; Cluster 2: Estonia, Latvia, Lithuania; Cluster 3: Bulgaria, Macedonia, Romania; Cluster 4: Albania; Cluster 5: Belarus, Moldova, Russia, Ukraine; Cluster 6: Armenia, Azerbaijan, Georgia; Cluster 7: Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan, Uzbekistan.
v. The line $\beta_1 = \beta_2$ provides the p-value corresponding to the F-stat on the equality of the coefficients of $MASS$ and PSG.

2.6 Conclusion

The analysis in this chapter supports various conclusions. First, our analysis supports the result of Zinnes *et al.* (2001) that privatization *per se* does not have any impact on output level. Second, while Zinnes *et al.* (2001) consider the importance of the strength of the institutional governance regime to empower owners to explain this result, we do so through the lens of methods of privatization. We especially show that countries which favor gradual sales have higher output level gains from privatization than those which favor massive giveaways.

However, if these results hold in a wide variety of specifications, they differ from Bennett *et al.* (2004a,b) who find that countries implementing massive giveaways have higher annual growth rates. Their results are derived from an econometric setting relating annual growth rate to factor inputs. When we control for macroeconomic stabilization and reforms, countries implementing massive giveaways do not have higher annual growth rates. Furthermore, results are very sensitive to the inclusion or exclusion of countries of Caucasus when the left-hand side variable is annual growth rate.

One possible interpretation of these results is that methods of privatization leading to a permanent change in the ownership structure of the economy have different effects on output levels but not on annual growth rates. While we have made every effort to use the best data, the amount of structural change occurring is enormous to claim unconditional success. Nevertheless, given that the results, when the left-hand side variable is output level, are in line with mechanisms expressed by Kornai (2000, 2001), Roland (2000) and Zinnes *et al.* (2001), and given that we have utilized a variety of econometric specifications, we feel that future investigations will broadly support our results.

2.A Appendix of chapter 2

Table 2.A1: Primary method of privatization by country and by year

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Albania												
MASS	0	0	0	0	0	0	0	0	0	0	0	0
MEBO	0	1	1	1	1	1	1	1	1	1	1	1
VEN	0	0	0	0	0	0	0	0	0	0	0	0
Armenia												
MASS	0	0	0	0	1	1	1	1	1	1	0	0
MEBO	0	1	1	1	0	0	0	0	0	0	0	0
VEN	0	0	0	0	0	0	0	0	0	0	1	1
Azerbaijan												
MASS	0	0	0	0	0	0	0	1	1	1	1	0
MEBO	0	0	0	0	0	0	1	0	0	0	0	0
VEN	0	0	0	0	0	0	0	0	0	0	0	1
Belarus												
MASS	0	0	0	0	0	0	0	0	0	0	0	0
MEBO	1	1	1	1	1	1	1	1	1	1	1	1
VEN	0	0	0	0	0	0	0	0	0	0	0	0
Bulgaria												
MASS	0	0	0	0	0	0	0	0	0	0	0	0
MEBO	0	0	0	0	0	0	0	0	0	0	0	0
VEN	0	0	0	1	1	1	1	1	1	1	1	1
Croatia												
MASS	0	0	0	0	0	0	0	0	0	0	0	0
MEBO	0	1	1	1	1	1	1	1	1	1	1	1
VEN	0	0	0	0	0	0	0	0	0	0	0	0
Czech Republic												
MASS	0	0	1	1	1	1	1	1	1	1	1	1
MEBO	0	0	0	0	0	0	0	0	0	0	0	0
VEN	0	0	0	0	0	0	0	0	0	0	0	0
Estonia												
MASS	0	0	0	0	0	0	0	0	0	0	0	0
MEBO	0	0	0	0	0	0	0	0	0	0	0	0
VEN	0	0	0	1	1	1	1	1	1	1	1	1
FYR Macedonia												
MASS	0	0	0	0	0	0	0	0	0	0	0	0
MEBO	0	0	0	1	1	1	1	1	1	1	1	1
VEN	0	0	0	0	0	0	0	0	0	0	0	0
Georgia												
MASS	0	0	0	0	0	1	1	1	1	1	1	1
MEBO	0	0	0	1	1	0	0	0	0	0	0	0
VEN	0	0	0	0	0	0	0	0	0	0	0	0
Hungary												
MASS	0	0	0	0	0	0	0	0	0	0	0	0
MEBO	0	0	0	0	0	0	0	0	0	0	0	0
VEN	1	1	1	1	1	1	1	1	1	1	1	1
Kazakhstan												
MASS	0	0	0	0	1	1	1	1	1	0	0	0
MEBO	0	0	0	0	0	0	0	0	0	0	0	0
VEN	0	0	0	0	0	0	0	0	0	1	1	1

Primary method of privatization by country and by year (continued)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Kyrghyzstan												
MASS	0	0	0	0	0	0	1	1	1	1	1	1
MEBO	0	1	1	1	1	1	0	0	0	0	0	0
VEN	0	0	0	0	0	0	0	0	0	0	0	0
Latvia												
MASS	0	0	0	1	1	1	1	1	1	0	0	0
MEBO	0	0	0	0	0	0	0	0	0	0	0	0
VEN	0	0	0	0	0	0	0	0	0	1	1	1
Lithuania												
MASS	0	1	1	1	1	1	1	1	1	1	1	1
MEBO	0	0	0	0	0	0	0	0	0	0	0	0
VEN	0	0	0	0	0	0	0	0	0	0	0	0
Moldova												
MASS	0	0	0	0	1	1	1	1	1	1	1	1
MEBO	0	0	0	0	0	0	0	0	0	0	0	0
VEN	0	0	0	0	0	0	0	0	0	0	0	0
Poland												
MASS	0	0	0	0	0	0	0	0	0	0	0	0
MEBO	1	1	1	1	1	1	0	0	0	0	0	0
VEN	0	0	0	0	0	0	1	1	1	1	1	1
Romania												
MASS	0	0	0	0	0	0	0	0	0	0	0	0
MEBO	1	1	1	1	1	1	1	1	1	1	1	1
VEN	0	0	0	0	0	0	0	0	0	0	0	0
Russia												
MASS	0	0	1	1	1	1	1	1	1	1	1	1
MEBO	0	0	0	0	0	0	0	0	0	0	0	0
VEN	0	0	0	0	0	0	0	0	0	0	0	0
Slovakia												
MASS	0	0	1	1	1	0	0	0	0	0	0	0
MEBO	0	0	0	0	0	1	1	1	0	0	0	0
VEN	0	0	0	0	0	0	0	0	1	1	1	1
Slovenia												
MASS	0	0	0	0	0	0	0	0	0	0	0	0
MEBO	1	1	1	1	1	1	1	1	1	1	1	1
VEN	0	0	0	0	0	0	0	0	0	0	0	0
Tajikistan												
MASS	0	0	0	0	0	0	0	0	0	0	0	0
MEBO	0	1	1	1	1	1	1	1	1	1	1	1
VEN	0	0	0	0	0	0	0	0	0	0	0	0
Turkmenistan												
MASS	0	0	0	0	0	0	0	0	0	0	0	0
MEBO	0	0	0	1	1	1	1	1	1	1	1	1
VEN	0	0	0	0	0	0	0	0	0	0	0	0
Ukraine												
MASS	0	0	0	0	0	1	1	1	1	1	1	1
MEBO	0	0	1	1	1	0	0	0	0	0	0	0
VEN	0	0	0	0	0	0	0	0	0	0	0	0
Uzbekistan												
MASS	0	0	0	0	0	0	0	0	0	0	0	0
MEBO	0	0	1	1	1	1	1	1	1	1	1	1
VEN	0	0	0	0	0	0	0	0	0	0	0	0

Notes: i. Based on EBRD (1994, 1996, 1997, 1998, 1999, 2000, 2001, 2002a).

Chapter 3

Which firms (believe they) have a soft loan? Evidence from a cross-country survey in transition economies[1]

3.1 Introduction

As said in the general introduction, the term "soft budget constraint" was first introduced by Kornai (1979) to illuminate economic behavior in socialist economies. It is now widely used to describe similar phenomena in post-socialist, developed and developing countries.[2] The concept alludes to a situation in which a loss-making firm is bailed out (by the government, a bank or another institution). Furthermore, the expectation of the firm manager as to whether the firm will be rescued from trouble or not is at the heart of the concept because this expectation affects his

[1] A part of this chapter is based on Bignebat, C. and Gouret, F. (2006), "Which firms have a soft loan ? Managers' beliefs in a cross-country survey in transition economies", *MOISA-INRA Working paper 200603*. Manuscript under second (minor) revision for *The Economics of Transition*.

[2] For example Huang and Xu (1999) believe that the SBC in the banking sector of East Asia played an important role in the financial crisis of the late nineties.

behavior (Kornai, 1979). Indeed, when managers anticipate being rescued should they get into trouble, there are an attenuation of effort to maximize profits and a weakening of the drive to innovate. Moreover, the price responsiveness is dulled (Kornai, 1998). Despite considerable progress in the last decade to give theoretical explanations to the SBC syndrome[3], empirical research on its determinants is still in its infancy (Djankov and Murrell, 2002, Kornai *et al.*, 2003). The foremost difficulty is in operationalizing the notion of softness. In line with the works of Kornai, an empirical measure has to capture the expectations of managers to be bailed out in case of trouble. Thus, SBC theorists argue that, for example, subsidization of loss-making firms is not identical to SBC.[4] Furthermore, they often highlight that empirical works are not closely grounded in theory (Kornai *et al.*, 2003, p.1100).

With these concerns in mind, this chapter uses survey data that elicits the expectations of firms to have an extension of the term of their loan if they fall behind in their bank repayments. Thus, we are close to the line of research initiated by Dewatripont and Maskin (1995) which considers that the SBC syndrome occurs when a bank cannot commit to keep an enterprise to a fixed initial budget and/or to maintain the timing of repayment specified by the contract. In Dewatripont and Maskin (1995), the poor prospects of a project are discovered *ex post* by the bank, that is only after it has already made a significant capital investment. But at that point, the bank may well be better off allowing the project to be completed by making a further infusion of capital. If it is the case, the firm has a *soft loan*. It implies that *ex ante* the capacity of the banks to apply accurate credit assessment is crucial. We use a data set of nearly 4500 loan applicants in 26 transition economies. We analyze the determinants of the managers' expectations to have a soft loan and use a censored bivariate probit, given that some projects are not financed by the banks. The selection equation, i.e. whether a firm is granted a loan

[3] See Kornai *et al.* (2003) for a review of theoretical explanations of the SBC syndrome.

[4] Qian and Roland (1998, p.1143) remark that "*subsidization of loss-making enterprises is often an indicator of soft budget constraints. However, subsidies are not identical to soft budget constraints. There are cases in which firms receive subsidies but do not expect to be bailed out in cases of bad financial performance.*"

or not, is also important because it determines the capacity of the banks to apply a good prior screen based, one would assume, on an assessment of default probability.

Consequently, we contribute to the progress of the SBC literature in at least two ways. First, our empirical work is close to Dewatripont and Maskin (1995) because we view soft budgets as the extension of credit even when the substandard performance of an already-financed investment project has been revealed. As highlighted by Kornai *et al.* (2003, p.1101), a large part of SBC phenomena can be understood in terms of this *ex ante/ex post* distinction, broadly constructed. For example, Kornai *et al.* (2003, p.1110) show that even state paternalism, presented as the causal link in the early writings on the SBC syndrome (Kornai, 1979, p.806), can be incorporated in such a framework. Second, we clearly follow the idea that the SBC is related to decision-makers' expectations. Until now, only Anderson *et al.* (2000) directly measure managers' expectations. They focus on the expectations of managers concerning state aid in case of financial difficulties by investigating a data set of 200 Mongolian firms. They examine various causes of soft budgets in addition to state ownership but they do not consider soft budgets as the extension of a credit when the firm falls behind in its bank repayments.[5]

However, our work has two caveats. First, simply observing managers' expectations to have soft loans can generate misleading conclusions if the main instruments of rescue are fiscal means (subsidies from the state budget or tax concessions). Nevertheless, various authors (Berglof and Roland, 1998, Dewatripont and Roland, 2000) point out that loans have become the main means of softening the BC in several countries. In particular, some banks tend to give preference to distressed enterprises when allocating credit and tolerate late repayment; see studies on Russia and Ukraine

[5] Two other important empirical papers provide indirect confirmation that the SBC is incorporated in managers' expectations. Using a sample of several hundred Chinese state firms over the period 1980-1994, Li and Liang (1998) show that losses were especially due to labor redundancy. It confirms that managers were convinced to be perpetually rescued. In a panel data set of Italian state-owned firms interviewed from 1977 to 1993, Bertero and Rondi (2000) show that managers' expectations evolved at the end of the 1980s: state firms responded to the decrease of subsidies and bank loans (probably due to the European Union pressure in order to reduce state aid and to accelerate privatization programs) by increasing productivity and reducing overmanning.

(Huang *et al.*, 2004, Brana *et al.*, 1999), on Romania (Coricelli and Djankov, 2001) and on a collection of post-socialist countries (Schaffer, 1998). Second, the validity of survey evidence concerning expectations rather than facts might be in question. Nevertheless, remark that even if expectations are erroneous, it is expectations that lead to inefficient enterprise decisions. Moreover, the self-reported measures of beliefs used in this chapter pass what psychologists sometimes call validation exercises: we provide some results that suggest that if a manager believes his firm will be helped out in case of trouble, he will become less responsive to the prices of the firm's inputs.

The remainder of the chapter is structured as follows. Section 3.2 describes our framework. It permits to highlight the determinants of the SBC that we will test. Section 3.3 presents our econometric methodology. Section 3.4 presents the data and the main results. Section 3.5 provides evidence that managers who have a loan and expect an extension if they fall behind in their bank repayments behave differently than those who have a loan and do not expect to be helped out. Finally section 3.6 presents a brief summary and conclusions.

3.2 To have a soft loan or not?

This section borrows from Kornai *et al.* (2003) and Boyes *et al.* (1989) and presents the main aspects of our framework.

There are three periods, a firm, headed by a manager, and a bank. Assume that the firm manager submits a project to the bank in period t. The bank must decide whether or not to grant a loan of an amount l_1. If funded, the project can yield a gross monetary return $R_g(> l_1)$ by the end of period $t+1$. It can also be defaulted. In this case the bank has two possibilities:

- It could begin legal proceedings to take possession of the collateral of a value Col.
- The bank alternatively could refinance the project by injecting additional cap-

ital of l_2, extend the term of the loan or do nothing and wait to obtain an expected gross return of R_p in $t+2$. In this case, the loan is *soft*.

Notice that if the project is defaulted and

$$R_p - l_2 > Col \ , \tag{3.1}$$

the loan is soft. Thus, the lower the collateral, the higher the probability of having a soft loan. Our data set allows to test the following implication (see section 3.4 for a presentation of the data):

Testable Implication 1 *The manager's expectation to have a soft loan is lower when the initial financing requires collateral.*

However, note that the firm has a soft loan if and only if the bank has not been able to apply a good prior screen in period t. The bank initially knows that the loan yields two possible outcomes that can be described by a Bernoulli trial:

$$\pi = \begin{cases} R_g - l_1 & \text{with probability} \quad p \\ \max\{R_p - l_2; Col\} - l_1 & \text{with probability} \quad (1-p) \end{cases} \tag{3.2}$$

If the bank knows all the parameters of the trial, it establishes a credit approval requirement for the project. The loan is approved if the probability of success p is such that:

$$p \geq \frac{l_1 - \max\{R_p - l_2; Col\}}{R_g - \max\{R_p - l_2; Col\}} \equiv \bar{p} \tag{3.3}$$

The firm has a soft loan if $p \geq \bar{p}$ and $R_p - l_2 > Col$. Remark that the SBC syndrome represents, in statistical inference terminology, a type II error: the bank fails to reject the initial funding of a poor project. Hence, the capacity of the bank to apply accurate credit assessment in period t is crucial because it can reduce the SBC problem.

This framework can be extended to include other circumstances that lead to soft budgets. First, the bank's ownership structure might matter. If a private bank is

presumably in the business of maximizing profit, it is not the case of a state-owned bank. A state bank is controlled by the government and, therefore, its financing decisions reflect the government's objectives. SBC theories explaining that a state bank will rescue a firm in case of trouble to complete a bad project are of two kinds. First, if the government is benevolent, the state bank maximizes the overall social welfare. So a troubled firm will be bailed out if its demise might cause external damage greater than the cost of rescue. For example, a state bank may choose to bail out an unprofitable monopoly, because the elimination of its production may upset other firms as well, and precipitate a serious loss to society (Segal, 1998). Second, if the government values the firm for its political support, the government considers the political benefit of keeping project workers employed. Kornai *et al.* (2003, p.1110) model these two reasons in the same way. They consider a parameter $E(>0)$ which might be the political benefit of keeping workers employed, or alternatively the external effect of a project on the rest of the economy. A state-owned bank will refinance a project if $R_p + E - l_2 > Col$. This condition is less demanding than $R_p - l_2 > Col$; thus we obtain the second testable implication[6]:

Testable Implication 2 *A manager who has obtained a loan from a state-owned bank has a higher expectation to have a soft loan than a manager who has obtained a loan from a private bank.*

Now, let's assume that there is a third player, the government, and that the bank is private. In such a case, if the firm is a political capital for the government (the firm is state-owned, too big to fail, or a monopoly), even a private bank might extend the term of the loan to the firm or wait and do nothing because the private bank expects the government will be the ultimate guarantor of the firm in case of trouble.

[6] If E is the political benefit of keeping project workers, the model could be interpreted along the lines of Boycko *et al.* (1996) who associate the SBC syndrome with the interventions of politicians in firms. In their model, politicians view softness as something desirable because it permits to influence enterprises' employment policy. In particular, they show that such influence is fostered by state ownership because politicians own the control rights to the firms.

Testable Implication 3 *A firm which is a political capital for the government is more likely to have a soft loan. Furthermore, a firm which is a political capital is more likely to obtain a loan.*

3.3 Econometric methodology

Given the model sketched above and the data at our disposal (that we will describe in the next section), expectations to have a soft loan are censored since banks do not grant a loan to all the applicants. Consequently the bivariate probit with censoring is the natural framework for our empirical analysis. This econometric model was first explored by Van de Ven and Van Praag (1981). This econometric model has been applied by Boyes *et al.* (1989) and Greene (1992, 1998) to develop statistical model of credit scoring, that is empirical prediction of loan default.

Suppose that Y_i^* is a continuous latent variable reflecting the degree of softness of the budget constraint of enterprise i. Then

$$Y_i^* = X1_i\beta + \epsilon_i \tag{3.4}$$

where $X1_i$ is a vector of variables that are considered as potential determinants of managers' expectations: the collateral, the number of competitors, the size and the ownership of the firm i. ϵ_i is an error term. We call this equation the $Soft$ equation. We consider the binary response of enterprise i about the expectation to have a soft loan or not:

$$Soft_i = 1 \quad \text{if} \quad Y_i^* > 0$$
$$Soft_i = 0 \quad \text{if} \quad Y_i^* \leq 0$$

The dependent variable, however, is censored since only firm applicants that have received a credit in period t are observed. To put this in a familiar context, the

selection equation is:

$$Loan_i = (Z_i\gamma + \eta_i > 0) \tag{3.5}$$

where $Loan_i = 1$ if the firm i obtains a loan, 0 otherwise. η_i is a perturbation term. Z_i includes traditional variables of credit scoring models: the firm's and manager's characteristics. This selection equation, called the *Loan* equation, is fundamental since the capacity of the banking system to apply accurate lending criteria is crucial. Finally, we assume that the perturbation terms ϵ_i and η_i have a bivariate normal distribution with zero means and correlation $\rho_{\epsilon\eta}$.

$$\begin{pmatrix} \epsilon_i \\ \eta_i \end{pmatrix} \sim \text{ bivariate normal } \left(\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 & \rho_{\epsilon\eta} \\ \rho_{\epsilon\eta} & 1 \end{pmatrix} \right) \tag{3.6}$$

The assumption that $\text{Var}(\epsilon_i) = \text{Var}(\eta_i) = 1$ is the standard normalization for probits. Equations 3.4-3.6 are the general specification of a bivariate probit with censoring. The probability of interest is the probability of expecting an extension of the term of the loan in case of trouble given that a loan is obtained, which is:

$$\text{Prob}[Soft_i = 1 | Loan_i = 1] = \frac{\Phi_2(X_{1i}\beta, Z_i\gamma, \rho_{\epsilon\eta})}{\Phi(Z_i\gamma)} \tag{3.7}$$

where Φ and Φ_2 are the standard cumulative normal and the cumulative bivariate normal distribution function, respectively.

3.4 Estimation results

3.4.1 Data and model specification

The data used in this chapter are drawn from BEEPS 2002, developed jointly by the World Bank and the EBRD. It is a survey of 6367 firms in 26 transition economies[7],

[7] Albania, Armenia, Azerbaijan, Belarus, Bosnia, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Poland, Romania, Russia, Slovakia, Slovenia, Tajikistan, Ukraine, Uzbekistan, Yugoslavia.

as well as in Turkey, conducted in the first half of 2002. It was collected on the basis of face-to-face interviews with owners, managers or finance officers through site visits by surveyors trained according to a standardized methodology. The sample was structured to be representative of each countries with specific quotas placed on size, sector, ownership and export orientation (MEMRB Custom Research Worldwide, 2002, Hellman and Kaufmann, 2002). We restrict our sample to firms in transition economies, i.e. we drop firms located in Turkey (511 observations). This sample of firms is called the BEEPS II sample in Table 3.1 where descriptive statistics are presented.

We know from the survey:

- If the firm has obtained a loan (the *Loan* variable).
- And in this case, if the firm believes whether the loan is soft or not (the $Soft$ variable).

Table 3.1: Descriptive statistics of the main variables of the sample

	BEEPS II sample			Original sample			Used sample				
Firm's characteristics	**Obs**	**Mean**	**Std. dev.**	**Obs**	**Mean**	**Std. dev.**	**Obs**	**Mean**	**Std. dev.**	**Min**	**Max**
The firm recently got a loan	5846	0.405	0.491	4621	0.512	0.499	3531	0.489	0.499	0	1
Unprofitable in 2001	5534	0.057	0.233	4388	0.061	0.239	3531	0.060	0.238	0	1
Largest shareholder											
Individual	5856	0.506	0.500	4631	0.514	0.499	3531	0.510	0.499	0	1
Family	5856	0.062	0.241	4631	0.065	0.248	3531	0.067	0.250	0	1
Domestic company	5856	0.068	0.252	4631	0.073	0.259	3531	0.073	0.260	0	1
Foreign company	5856	0.101	0.302	4631	0.095	0.294	3531	0.096	0.295	0	1
Manager of the firm	5856	0.029	0.169	4631	0.030	0.172	3531	0.029	0.169	0	1
Employees of the firm	5856	0.035	0.185	4631	0.036	0.186	3531	0.037	0.189	0	1
Government	5856	0.135	0.342	4631	0.123	0.329	3531	0.128	0.334	0	1
Others	5856	0.062	0.241	4631	0.060	0.238	3531	0.058	0.232	0	1
Firm's size											
Less than 49 employees	5856	0.680	0.467	4631	0.669	0.470	3531	0.664	0.472	0	1
Between 50 - 249 employees	5856	0.183	0.386	4631	0.186	0.389	3531	0.186	0.389	0	1
More than 250 employees	5856	0.137	0.344	4631	0.144	0.351	3531	0.149	0.356	0	1
Number of competitors											
Monopoly	5742	0.013	0.115	4542	0.013	0.113	3531	0.013	0.113	0	1
1-3 competitors	5742	0.168	0.374	4542	0.163	0.369	3531	0.166	0.372	0	1
4 or more competitors	5742	0.819	0.385	4542	0.823	0.380	3531	0.820	0.383	0	1
Customers											
Sales to government	5856	10.683	24.462	4631	10.269	23.68	3531	10.820	24.37	0	100
Sales to multinationals	5856	4.021	14.118	4631	4.024	13.77	3531	4.18	14.14	0	100
Manager's characteristics											1
Expect to be bailed out by the bank	2025	0.412	0.492	2025	0.412	0.492	1676	0.405	0.490	0	1
Loan's characteristics											
collateral	2368	0.806	0.395	2368	0.806	0.385	1676	0.815	0.378	0	1
Financing Source											
Local private bank	5856	0.079	0.270	4631	0.100	0.300	3531	0.096	0.293	0	1
State bank	5856	0.045	0.206	4631	0.056	0.230	3531	0.052	0.221	0	1
Foreign bank	5856	0.019	0.138	4631	0.024	0.154	3531	0.024	0.153	0	1
From family and friends	5856	0.068	0.253	4631	0.073	0.260	3531	0.070	0.255	0	1
Government	5856	0.020	0.141	4631	0.017	0.130	3531	0.015	0.121	0	1
Exclusion variables											
External auditor	5703	0.497	0.500	4513	0.491	0.499	3531	0.491	0.499	0	1
International accounting standards	5371	0.405	0.491	4237	0.397	0.489	3531	0.385	0.486	0	1
Training	5797	0.512	0.500	4584	0.525	0.499	3531	0.525	0.499	0	1

Notes: i. The BEEPS II sample includes all the firms surveyed in BEEPS II, Turkish firms excluded.
ii. The original sample includes all the firms of the BEEPS II sample that are assumed to be loan applicants. (Original sample = BEEPS II sample *minus* firms that are not loan applicants.)
iii. The used sample includes all the firms of the original sample, except those that have missing values in variables of our baseline model (estimated in Table 3.3).

An important point is to know which firms have to be included in our analysis. i) Do we have to consider only firms which have applied for a loan? In other words, do we have to drop all the firms that have not submitted a project? ii) Or do we have to consider all the firms of the BEEPS II sample? As we will explain in subsection 3.4.4, the choice between i) and ii) is a relevant question for our analysis. Here we set an important part of these concerns aside for the moment and provide the following argument in favor of dropping all the firms that have not applied for a loan. By doing so, the *Loan* equation provides information on the credit assessment realized by the banks. If we consider all the firms of the BEEPS II sample, the selection equation will not tell us whether a project is denied or not submitted. To clearly understand why, let's take an example. Assume that our data set is composed of all the firms of the BEEPS II sample, and we find that monopolies are less likely to obtain a loan. In this case, it is probably because a credit demand effect (monopolists need to borrow less) dominates a credit supply effect (banks prefer to lend to monopolists, as they are more creditworthy).

The problem is that we do not know directly from the survey if a firm which does not have a loan has been applicant. However, we know if this firm faces major obstacles to get a financing from banks. Consequently, we assume that firms which do not have a loan and which answer that they do not face major obstacles to get a financing have not applied. So we drop of the survey all these firms (1225 firms, Turkish firms excluded) and consider that the applicants are the firms which have obtained a loan (2368) and those firms which do not have a loan and which say that they face major obstacles to get a financing from banks (2253). Consequently, our sample is composed of 4621 loan applicants.[8] This sample of 4621 firms is called the original sample in Table 3.1. However, some of these 4621 respondents fail to answer some questions that serve as explanatory variables. At the end the used sample is composed of 3531 firms, as shown by Table 3.1. We believe that the

[8] The initial data set is composed from 6367 firms. We drop first 511 Turkish firms. We also drop 1225 firms which have not submitted a proposal to a bank. Finally, 10 officials do not answer whether they have obtained a loan or not.

missing observations do not bias our results because the summary statistics of the original and the used samples look very similar (see Table 3.1).[9]

The $Soft$ variable reflects the expectations of managers concerning the bank's reaction if they fall behind in their bank repayments. More precisely, the question is the following:

> *Now I would like to ask you a hypothetical question. If your firm were to fall behind in its bank repayments, which of the following would best describe how you would expect the bank to react?* [1] *Do nothing*, [2] *Extend the term of the loan without changing the condition,* [3] *Extend the term of the loan but increase the interest rate,* [4] *Begin legal proceedings to take possession of assets*, [5] *Don't know.*

Table 3.2: Enterprise officials were asked the following question: If your firm were to fall behind in its bank repayments, which of the following would best describe how you would expect the bank to react?

	Total sample		**Used sample**	
	Number	**Percent**	**Number**	**Percent**
[1] Do nothing	106	5.23	84	5.01
[2] Extend the term of the loan without changing the condition	729	36.00	593	35.42
[3] Extend the term of the loan but increase the interest rate	800	39.51	663	39.54
[4] Begin legal proceedings to take possession possession of assets	390	19.26	336	20.03
Total	2025	100.00	1676	100

Table 3.2 gives the responses of the enterprises. None of the managers answers that [5] they do not know. We assume that $Soft_i = 1$ if the manager of the firm i [1] expects the bank will do nothing or [2] expects the bank to extend the term of the loan without changing the condition. Indeed, in these two cases, the loan is soft. $Soft_i = 0$ if the manager of the firm i expects [3] the bank will extend the term of the loan but increase the interest rate, or [4] the bank will begin legal proceedings to take possession possession of assets. Considering that $Soft_i = 0$ when the manager of the firm i expects [3] is defensible, but admittedly arbitrary. Consequently, we shall present a set of robustness checks with $Soft = 1$ when managers answer [3].

[9] So the loss of observations caused by missing answers is around 23%$\simeq$ $(\frac{4621-3531}{4621})$ of the original sample.

Following the framework of section 3.2, there are five sets of regressors of the $Soft$ equation in which we are mainly interested. The variables of special interest are the following:

- We consider the variable $Collateral$ to test implication 1, with $Collateral = 1$ if the initial financing has required collateral, 0 otherwise.

- For implication 2, we consider a set of dummy variables that reflects the ownership type of the main financial source of the firm. However, we note that the BEEPS data set does not specify if the loan in consideration comes from the main financial source of the firm. We need to keep this problem in mind when analyzing the results.

- For implication 3, we first consider a set of dummy variables that depicts the type of the firm's main shareholder. In particular, we expect managers of state firms to be more likely to anticipate an extension of the term of their credits when they fall behind in their bank repayments. Furthermore, a state firm might be a political capital and a bank will rather grant a loan to its because it expects the government to play as a ultimate guarantor.

- Second, we also consider a set of dummy variables that describes the firm's size. We expect the beliefs of soft loan to be higher for large firms. Furthermore, the bigger the firm, the higher the probability that it is a political capital for the government, and thus the higher is the probability of having its loan application initially accepted.

- Third, a set of dummy variables standing for the number of competitors is introduced.

We also include various control variables that might explain managers' expectations. First, we consider the age and education of the managers through the use of

dummy variables.[10] Second, we include a dummy variable indicating whether the firm had financial difficulties in the recent past or not and the percentage of sales by customers (the government, multinational or others). In addition to these variables, we control for sectoral effects, for which we use the eight-sector categorization proposed by BEEPS[11], and country-specific effects.

The right-hand side variables of the *Loan* equation are, like in a traditional credit scoring model, variables reflecting the characteristics of a firm and its manager. Thus they are mainly the same than those of the $Soft$ equation.[12] As a technical point, identification of the parameters of the $Soft$ equation can rely simply on the non-linearity of the two equations of the bivariate probit (as in Boyes *et al.*, 1989, p.9). However, it is better handled *via* an exclusion restriction, i.e. a variable that ideally influences the *Loan* equation but not the $Soft$ equation. Although it would be helpful for identification, one might argue that anything that plausibly makes the bank more willing to lend to the firm should also make it more willing to refinance it. This argument is not valid because it is not the decision of the bank to refinance a project that we look at in the $Soft$ equation, but the manager's belief to have an extension of the term of the loan *if* the firm is in trouble. Various characteristics that plausibly make the bank less willing to lend to the firm might make the firm more willing to expect an extension of the term of the loan in case of trouble. For example, *ceteris paribus* we expect the bank to reject the loan application of a firm that was in trouble in the recent past. However, if a firm that was unprofitable obtains a loan, it means that "*the growth of the firm starts to break away from its financial situation* [and] *the manager of the firm* ***may feel*** *that the probability has*

[10] As done by BEEPS, we group the ages into 6 categories: 20-29, 30-39, 40-49, 50-59, 60-69, and 70 or more. Levels of education are grouped into 6 categories: did not complete secondary school, secondary school, vocational training, some university training, completed university degree, and completed higher university degree.

[11] The eight sectors are: i) mining and quarrying, ii) construction, iii) manufacturing, iv) transport storage, v) Wholesale, retail, repairs, vi) Renting and business services, vii) Hotels and restaurants and viii) other.

[12] However, remark that for the $Soft$ equation we have information on more variables: the main financing source that we assume to be the bank that has granted the loan and if the loan has required collateral. Thus, we can include in the $Soft$ equation at least two characteristics of the loan which are relevant for explaining the softness/hardness of the loan.

grown that his firm would also survive despite a financial failure caused by a wrong investment" (Kornai, 1979, p.807). So a firm recently in trouble is less likely to obtain a loan, but if it obtains one, it will be more likely to expect an extension in case of trouble.

A good exclusion restriction would be a signal that increases the prior probability p that the project submitted by the firm is good (see equation 3.3). When the bank understands that the firm is in trouble, the bank does not consider the signal in the same way. A firm that lets its financial statement reviewed by an external auditor appears to be a good candidate. Indeed, it permits to present an unbiased and independent evaluation on its financial statement. But if the firm falls behind in its bank repayments, it means that the external audit was incorrect. Consequently, there is no reason for the bank to consider it in its decision to extend or not the term of the loan. We also include two other identification variables in the selection equation: a dummy indicating if the firm uses international accounting standards (IAS), and a dummy variable indicating if some employees received training in 2001 (managers or workers). Indeed, these variables can also be perceived as signals of a dynamic firm. (Remark: none of these three variables is statistically significant when we include them in a probit estimation of the $Soft$ equation).

3.4.2 Results

The bivariate censored probit estimates for the loan granting decision ($Loan$) and expectation of an extension in case of trouble ($Soft$) are presented in Table 3.3. Estimates for this model are obtained by maximizing the following log-likelihood:

$$\begin{aligned}
\ln(L) &= \begin{cases}
\sum_{\substack{Loan_i=1\\Soft_i=1}} \ln(\text{Prob}[Soft_i=1|Loan_i=1]\text{Prob}[Loan_i=1]) \\
+\sum_{\substack{Loan_i=1\\Soft_i=0}} \ln(\text{Prob}[Soft_i=0|Loan_i=1]\text{Prob}[Loan_i=1]) \\
+\sum_{Loan_i=0} \ln(\text{Prob}[Loan_i=0])
\end{cases} \\
&= \sum_{\substack{Loan_i=1\\Soft_i=1}} \ln \Phi_2(X1_i\beta, Z_i\gamma; \rho_{\epsilon\eta}) + \sum_{\substack{Loan_i=1\\Soft_i=0}} \ln \Phi_2(-X1_i\beta, Z_i\gamma; -\rho_{\epsilon\eta}) + \sum_{Loan_i=0} \ln \Phi(-Z_i\gamma)
\end{aligned} \tag{3.8}$$

There are several types of marginal effects we want to evaluate in the baseline model of Table 3.3. As previously said, the probability of interest in this model is the probability of expecting an extension of the term of the loan in case of trouble given that a loan is accepted. Thus, the first type of marginal effects (or discrete change for dummy variables) we want to evaluate is $\frac{d\text{Prob}[Soft=1|Loan=1]}{dX1}$. One might also be interested in the loan granting decision, so the second type of marginal effects we want to evaluate is $\frac{d\text{Prob}[Loan=1]}{dZ}$. Given that all the firms that have not been loan applicants are excluded of our sample, $\frac{d\text{Prob}[Loan=1]}{dZ}$ permits to understand which firms are more likely to have their credit accepted or denied. Table 3.4 presents these marginal effects at the mean values.

Tables 3.A1 and 3.A2 in Appendix present marginal effects of some specifications that are slightly different than the one of the baseline model of Table 3.3. In Table 3.A1, we present the marginal effects of various specficiations where some explanatory variables of the baseline model are excluded. (So with the exception of the excluded explanatory variables, we control for all the other variables that are in the specification of Table 3.3: country dummies, sector of activity, percentage of sales by customers...). In Table 3.A2, we divide the data set into the CIS and non-CIS firms. The reasons for doing this will become clearer later in the discussion. We report at the bottom of each specification the difference(s) with the one of Table 3.3.

The collateral-testable implication 1-

In line with the framework presented in section 3.2, managers of firms whose initial financing has required collateral are less likely to expect an extension of the term of the loan in case of trouble. The collateral decreases the probability of expecting an extension in case of trouble by 8.2 percentage points (Table 3.4).

Ownership of the bank-testable implication 2-

Surprisingly, there is no statistically significant difference between the various possible financing sources. This result is perhaps due to the fact that we do not really know if the main financing source is the bank which grants the loan.

The size of the firm-testable implication 3-

Table 3.3: Bivariate censored probit estimates

	Soft		**Loan**	
	Coef.	(Std. error)	Coef.	(Std. error)
Firm's characteristics				
Main shareholder				
Individual	0.065	(0.109)	0.071	(0.061)
Family	-0.136	(0.159)	0.231***	(0.083)
Domestic company	-0.141	(0.149)	0.392***	(0.077)
Foreign company	Base group		Base group	
Managers	0.165	(0.220)	-0.0123	(0.112)
Employees	0.204	(0.182)	0.204**	(0.103)
Government	0.117	(0.135)	-0.133*	(0.073)
Others	0.120	(0.156)	0.0162	(0.089)
Firm's size				
Employees<50	-0.104	(0.169)	-0.487***	(0.045)
50≤Employees<250	Base group		Base group	
Employees≥250	-0.088	(0.102)	0.230***	(0.049)
Number of competitors				
Monopoly	-0.280	(0.278)	-0.124	(0.151)
1-3 competitors	Base group		Base group	
4 or more competitors	0.045	(0.084)	-0.085*	(0.045)
Customers				
Sales to gov.	-0.227	(0.161)	-0.062	(0.078)
sales to multi.	-0.316	(0.221)	0.244**	(0.110)
Unprofitable in 2001	0.225*	(0.130)	-0.112†	(0.071)
Loan's characteristics				
Collateral	-0.205**	(0.089)		
Financing source				
Local private bank	0.0950	(0.079)		
State bank	0.00591	(0.102)		
Foreign bank	0.0731	(0.151)		
From family-friends	-0.132	(0.139)		
Government	-0.196	(0.302)		
External audit			0.153***	(0.041)
IAS			0.0780*	(0.041)
Training			0.238***	(0.036)
Manager education dummies	Yes		Yes	
Manager age dummies	Yes		Yes	
Sector dummies	Yes		Yes	
Country dummies	Yes		Yes	
$\rho_{\epsilon\eta}$ (std. error)		-0.413	(0.359)	
Wald test		1.32		
Obs. censored		1855		
Obs.		3531		
Log likelihood		-3068.40		

Notes: i. † , ∗, ∗∗ and ∗ ∗ ∗ represent 15, 10, 5 and 1% significance, respectively.
ii. Huber/White/sandwich standard errors are in parentheses.

Table 3.4: Marginal effects of the bivariate probit with censoring

	$\frac{d\text{Prob}[Loan=1]}{dZ}$	$\frac{d\text{Prob}[Soft=1\|Loan=1]}{dX1}$
Main shareholder		
Individual	0.0281	0.034
	(0.024)	(0.043)
Family	0.091***	-0.029
	(0.032)	(0.059)
Domestic company	0.154***	-0.015
	(0.029)	(0.053)
Foreign company	Base group	
Managers	-0.004	0.066
	(0.044)	(0.092)
Employees	0.081**	0.106†
	(0.041)	(0.0706)
State	-0.052*	0.032
	(0.029)	(0.054)
Others	0.006	0.051
	(0.035)	(0.064)
Firm's size		
Employees<50	-0.192***	-0.095***
	(0.017)	(0.033)
50<Employees<250	Base group	
Employees>250	0.091***	-0.010
	(0.019)	(0.037)
Number of competitors		
Monopoly	-0.049	-0.117
	(0.059)	(0.093)
1-3 competitors	Base group	
4 or more competitors	-0.033*	0.009
	(0.018)	(0.033)
Loan's characteristics		
Collateral		-0.082**
		(0.034)
Unprofitable in 2001	-0.044†	0.079†
	(0.028)	(0.055)
$\rho_{\epsilon\eta}$ (std. error)	-0.413 (0.359)	
Wald test	1.32	
Obs. censored	1855	
Obs.	3531	

Notes: i. †, *, ** and *** represent 15, 10, 5 and 1% significance, respectively.
ii. Robust standard errors are in parentheses.
iii. $\frac{d\text{Prob}[Loan=1]}{dZ}$ is the marginal effects of changes in Z on the probability of having a loan application accepted at the mean values. $\frac{d\text{Prob}[Soft|Loan=1]}{dX1}$ is the marginal effects of changes in $X1$ on the probability of expecting an extension of the term of the loan in case of trouble given that a loan is granted.
iv. These marginal effects are associated with the log-likelihood estimates of the bivariate probit with censoring presented in Table 3.3.

The larger the firm, the more likely it is to have its loan application accepted. The first column of Table 3.4 indicates that the probability of having its application accepted is 9.1 percentage points higher for a firm with more than 250 employees than for a firm that has between 50 and 250 employees. Compared to this base group, the probability is 19.2 percentage points lower for a firm with less than 50 employees. Furthermore, these firms are 9.5 percentage points less likely to expect an extension in case of trouble.

Ownership of the firm-testable implication 3-

A surprising result is that being a state-owned firm decreases the probability of having its loan application accepted by 5.2 percentage points at the mean values. Furthermore, a state firm which obtains a loan is not more likely than a foreign firm to believe the bank will help in case of trouble. On the contrary, when firms are owned by employees, firms are 8.1 percentage points more likely than foreign firms to have an application accepted. Moreover, a firm owned by employees is 10.6 percentage points more likely to expect an extension of the term of the loan in case of trouble. However, this estimated marginal effect is statistically significant only at the 15 percent level.

These results, apparently paradoxical, might be explained by various elements. On the one hand, many authors highlight that governments have drastically reduced subsidies to SOEs, especially in Hungary and Poland since the beginning of the nineties(Aghion and Blanchard, 1994, Pinto *et al.*, 1993). On the other hand, policymakers gave away firms' ownership and control to employees to lean on them for supporting reforms in CIS countries in the nineties (Hirschler, 2000, Kornai, 2001). Thus, politicians could not do anything but help them in case of trouble through an extension of the terms of repayment (if the government controls the bank), or subsidies. Otherwise, the political capital accumulated in these firms would have been lost.

In line with these remarks, it seems that the results concerning employee ownership are driven by CIS data. Table 3.A2 in Appendix presents the marginal effects

when we divide the data set into the CIS and non-CIS firms. Remark that Table 3.A2 indicates that we exclude Manager age and education dummies. The reason is that the number of firms in certain categories becomes too low to obtain consistently significant results (it is the case when we only consider firms in CIS countries). Thus, to compare the results of Table 3.A2 with an adequate specification where all the firms are included, Table 3.A1 (model [C]) proposes the marginal effects of a model where all the explanatory variables of Table 3.3 are included, except Manager age and education dummies.

When we consider the CIS firms, being a firm owned by employees increases the likelihood of having its loan application accepted by 11.4 percentage points. Furthermore, the probability of expecting an extension in case of trouble is 20.2 percentage points higher when a firm is owned by its employees. (This effect is statistically significant at the 1 percent level). The probability of having an application accepted is 5.5 percentage points lower for a firm that is state owned than for a foreign company. And the probability of expecting an extension is 12.7 percentage points higher for a state firm (this effect is only significant at the 15 percent level). On the contrary, in the non-CIS countries, firms owned by employees and state firms are not more likely to have their loan application accepted and do not have different expectations than the base group.[13]

Number of competitors-testable implication 3-

In our baseline specification of Table 3.4, a firm with more than 4 competitors has a 3.3 percentage points lower probability to have its application accepted than a firm that has less than 4 competitors. But the competition environment does not seem to influence managers' expectations.

Past firm's performance

As shown by Table 3.4, firms which were unprofitable in 2001 have a 4.4 percentage points lower probability to have their application accepted. This result might suggest that there has been an amelioration of the banking system since the

[13] Differences also occur for family firms: a family firm is more likely than foreign firms to obtain a loan in non-CIS countries. It is not the case in CIS countries.

nineties in transition economies. Indeed a number of empirical surveys confirm that banks tended to give preference to distressed firms to allocate credit in the nineties (e.g., Bonin and Schaffer, 1995, Brana *et al.*, 1999, Coricelli and Djankov, 2001, Huang *et al.*, 2004). However, when we divide the data set into the CIS and non-CIS firms in Table 3.A2, results indicate an important heterogeneity. Managers of firms which were in financial distress in 2001 are less likely to have an application accepted in non-CIS countries. But this is not the case in CIS countries. Furthermore, those which were unprofitable in 2001 in CIS countries are 22.1 percentage points more likely to believe that they will have an extension of the term of their loan in case of trouble (Table 3.A2).

Lastly, the estimate of $\rho_{\epsilon\eta}$ that maximizes the bivariate probit likelihood is -0.413, with a standard error of 0.359. Two remarks are necessary. First, the Wald statistic for the test of the hypothesis that $\rho_{\epsilon\eta}$ equals zero is $(-0.413/0.359)^2 = 1.323$. This is not significant, so the hypothesis that $\rho_{\epsilon\eta}$ equals zero cannot be rejected.[14] This result might seem counterintuitive, given the setting. Surely $Soft$ and $Loan$ are correlated, but this finding does not contradict that proposition. The correlation coefficient measures the correlation between the disturbances in the equations. That is, $\rho_{\epsilon\eta}$ measures the correlation between $Soft$ and $Loan$ after the influence of the included factors is accounted for.[15] Thus, when we exclude from the baseline specification a set of variables that have an important impact on $Loan$ and $Soft$, say the firm's size variables like in specification [A] of Table 3.A1, the estimate of $\rho_{\epsilon\eta}$ is -0.504, with a standard error of 0.229. And it is statistically significant at the 5 percent level (see the specification [A] of Table 3.A1).

The second remark concerns the negative value of the estimate of $\rho_{\epsilon\eta}$ in our baseline specification, as well as in the specifications of Table 3.A1. As mentioned in subsection 3.4.1, one would have argued that anything that plausibly makes the bank more willing to lend to the firm should make the firm more willing to expect

[14] For a single restriction, 1.323 is the 75 percent critical value from the chi-squared table.

[15] Greene (1992, p.21) makes a similar remark on the interpretation of the correlation coefficient in bivariate probits and Heckman selection models.

an extension in case of trouble. If it was true, unmeasured factors which contribute positively to the obtention of a loan would positively influence the expectation of an extension in case of trouble. (In an extreme case, if identical explanatory factors influence the selection and the subsequent outcome of interest in the same way, $\rho_{\epsilon\eta}$ will equal one). But the estimate of $\rho_{\epsilon\eta}$ is always negative.

3.4.3 Additional results and robustness checks

In this subsection, we ask whether our basic results of Table 3.4 are robust. Our primary concern here is that we might have omitted (measurable) characteristics of the firm that might be correlated with the explanatory variables of interest. As a consequence, the impact of some variables might be overstated.

In Table 3.A3 in Appendix, we include the following additional explanatory variables in the baseline model: a set of dummy variables that describes the number of suppliers of the firm's main material input (None, 1-3, or more than 4), the percent of sales in 2001 lost due to delivery delays from the material input suppliers, a dummy variable that equals 1 if the firm has ever had to resolve an overdue payment, a dummy variable that equals 1 if the firm is member of a business association, and the rate of interest. All these variables are included in both the *Loan* and the $Soft$ equations, except the rate of interest that is only included in the $Soft$ equation. Remark that including these additional variables reduces the number of observations from 3531 in the baseline model to 3241 (that is why they were not included in the baseline model). Despite of these gaps in our data set, our results are broadly the same.

Second, the $Soft$ variable reflects the expectations of managers concerning the bank's reaction in case of trouble. We have highlighted in subsection 3.4.1 that we have considered $Soft = 0$ when managers expect [4] the bank to begin legal proceedings to take possession of assets or expect [3] the bank to extend the term of the loan but increase the interest rate. Considering that $Soft = 0$ when managers answer [3] is arbitrary. Thus, in Table 3.A4 in Appendix, we consider that $Soft = 1$

when managers answer [1], [2] or [3].[16] Results are broadly the same. The main difference concerns the collateral variable: changing the definition of $Soft$ reduces (in absolute value) the marginal effect of the collateral from -8.2 percentage points in the baseline model to -5.1. But this negative effect is still significant at the 5 percent level.[17]

3.4.4 Do we really have to exclude firms that are not loan applicants from our sample?

Until now, we have considered that the relevant sample for our analysis is a sample where all the firms that have not been loan applicants are dropped. It has been a simple way to see the credits denied by banks. However, this subsection explains that this used sample might give an upward biased estimate of the probability of expecting an extension of the term of the loan in case of trouble for a firm selected at random from the full population of firms.

The reason follows from Dewatripont and Maskin (1995). In their model, the quality of the project is known by the manager but not the bank in period t. Thus there is asymmetric information. Faced with a poor project in period $t+1$, the bank could begin legal proceedings to take possession of assets, in which case the manager gets a negative private benefit (representing, say, the manager's loss of reputation). Alternatively, the bank could extend the term of the loan. In this case the gross return in period $t+2$ is R_p and the manager's benefit is positive: as assumed by Dewatripont and Maskin (1995), a manager can extract more from a project the longer it continues. Consequently, when the manager has to decide at the beginning of period t wether or not to submit his project, if he expects that he will have an extension in case of trouble, he submits the project because he will have a positive

[16] Remember that [1] means that the manager expects that the bank will do nothing if the firm falls behind in its bank repayments and [2] the bank will extend the term of the loan.

[17] Remark that Table 3.A4 indicates that we exclude Manager education dummies. The reason is that the number of firms in certain categories becomes too low to obtain consistently significant results.

private benefit. Thus, for a given set of attributes, $X1$, applicants might be more likely to expect an extension of the term of their loan if they fall behind in their bank repayments than otherwise similar firms chosen randomly from a population that is a mixture of firms which have applied or not. Of course, submitting a project does not imply that the firm will obtain a loan. But in some transition economies, there are evidence that banks do not apply accurate lending criteria (Berglof and Bolton, 2002, pp.82-84). Since loan recipients do not pass an accurate prior screen, the decision to apply or not also determines the selection process. Following this line of reasoning, we have to use all the firms of the BEEPS II sample.

An elegant possibility would be to use a trivariate probit specification to model this. A trivariate probit would extend our model to three outcome variables just by adding an *Application* equation ($Application_i = 1$ if the firm i has applied, 0 otherwise).[18] The obstacle to such an extension is practical. Some progress has been made on the evaluation of higher than bivariate normal integrals. But as Greene (2003, p.714) highlights, existing results are not sufficient to allow accurate and efficient evaluation for more than two variables in a sample of even moderate size.[19]

As a substitute, we propose a bivariate probit with censoring considering the BEEPS II sample. The outcome of special interest is still the $Soft$ equation. But now the selection equation is neither a credit supply equation (that is the bank's decision to fund or not a project submitted) nor a credit demand equation (that is the manager's decision to submit or not a project); it is a reduced form relationship.

Table 3.5 presents the marginal effects of some important variables in three differ-

[18] For a given firm, $Soft_i$ would not be observed unless $Loan_i$ equals one, and $Loan_i$ would not be observed unless $Application_i$ equals one. The perturbation terms ϵ_i (for the $Soft$ equation), η_i (for the *Loan* equation) and, say μ_i (for the *Application* equation), would have a trivariate normal distribution with zero means, unit variances, and correlations $\rho_{\epsilon\eta}$, $\rho_{\epsilon\mu}$, $\rho_{\eta\mu}$. If $\rho_{\epsilon\mu}$ did not equal 0, the first selection equation, that would be the decision to submit a project or not (the *Application* equation), would be of consequence.

[19] We made some tentatives, computing the trivariate normal cumulative density function that are implied by such a model with the GHK (Geweke-Hajivassiliou-Keane) smooth recursive conditioning simulator, as do Cappellari and Jenkins (2006). A model was evaluated using Maximum Simulated Likelihood techniques (MSL). However, we did not obtain convergent estimators. We believe that an important reason is the high number of dummy variables in our database. For extensive discussion of the principles underlying the GHK simulator and MSL estimation, see Gouriéroux and Monfort (1995) and Hajivassiliou *et al.* (1996).

ent specifications. In the first one, we consider all the firms of the BEEPS II sample. The variables included in the *Loan* and $Soft$ equations are the same as in the specification of Table 3.3. (So we control for all the variables that are in the specification of Table 3.3: country and sectorial dummies, percentage of sales by customers, age and education of the manager...). Remark that there is a loss of observations: the BEEPS II sample is composed of 5856 firms but some of them do not answer some questions. At the end the sample is composed of 4537 observations, as reported at the bottom of Table 3.5. In the second and third specifications, we divide the BEEPS II sample into the CIS and non-CIS firms. We also control for all the variables of Table 3.3, except Manager age and education dummies.[20] For each specification, we propose the marginal effects of interest, that is $\frac{d\text{Prob}\left[Soft_i=1\middle|Loan_i=1\right]}{dX1}$.[21]

Results are broadly the same as in Table 3.4. The main difference with the results of subsection 3.4.2 concerns the firms owned by managers when we only consider firms in the CIS countries. Firms owned by managers in the CIS countries were 15 percentage points more likely than foreign firms to expect an extension in case of trouble in Table 3.A2. This effect was statistically significant only at the 15 percent level. In Table 3.5, this effect increases to 21.5 percentage points and is statistically significant at the 10 percent level.

[20] The reason is the same as in Table 3.A2: the number of firms in certain categories becomes too low to obtain consistently significant results.

[21] Table 3.5 also provides $\frac{d\text{Prob}\left[Loan_i=1\right]}{dZ}$ for the interested reader who wants to compare these marginal effects with those of the previous subsection. It illustrates the fact that now the selection equation is a reduced form relationship. For example, remember that we previously found that firms with less than 4 competitors were more likely to have their application accepted than firms with 4 or more competitors. Now, we find that firms with less than 4 competitors are not more likely to obtain a loan. Probably, this difference is because a credit demand effect (firms with few competitors need to borrow less) counterbalances a credit supply effect (banks prefer to lend to firms with few competitors, as they are more creditworthy).

Table 3.5: Marginal effects when we consider the BEEPS II sample

	All the BEEPS II sample		CIS countries		Non-CIS countries	
	$\frac{d\Pr[Loan=1]}{dZ}$	$\frac{d\Pr[Soft=1\|Loan=1]}{dX1}$	$\frac{d\Pr[Loan=1]}{dZ}$	$\frac{d\Pr[Soft=1\|Loan=1]}{dX1}$	$\frac{d\Pr[Loan=1]}{dZ}$	$\frac{d\Pr[Soft=1\|Loan=1]}{dX1}$
Main shareholder						
Individual	0.055**	0.035	0.0209	0.069	0.090***	-0.005
	(0.021)	(0.044)	(0.028)	(0.071)	(0.030)	(0.056)
Family	0.124***	-0.029	0.043	-0.011	0.169***	-0.074
	(0.031)	(0.059)	(0.048)	(0.113)	(0.039)	(0.069)
Domestic company	0.152***	-0.013	0.132***	0.0199	0.169***	-0.027
	(0.029)	(0.054)	(0.041)	(0.088)	(0.038)	(0.068)
Foreign company	Base group		Base group		Base group	
Managers	0.038	0.069	0.067	0.215*	0.0008	-0.058
	(0.041)	(0.093)	(0.056)	(0.125)	(0.058)	(0.114)
Employees	0.090**	0.110†	0.089*	0.212**	0.053	-0.005
	(0.038)	(0.076)	(0.048)	(0.106)	(0.061)	(0.111)
State	-0.059**	0.032	-0.056*	0.119	-0.072**	-0.033
	(0.024)	(0.054)	(0.031)	(0.088)	(0.035)	(0.068)
Others	0.012	0.052	-0.018	0.180†	0.044	-0.007
	(0.031)	(0.064)	(0.043)	(0.123)	(0.042)	(0.074)
Firm's size						
Employees<50	-0.175***	-0.092***	-0.187***	-0.133***	-0.175***	-0.099**
	(0.016)	(0.033)	(0.021)	(0.050)	(0.023)	(0.045)
50≤Employees<250	Base group		Base group		Base group	
Employees≥250	0.089***	-0.011	0.043*	-0.013	0.141***	-0.010
	(0.018)	(0.037)	(0.025)	(0.062)	(0.025)	(0.048)
Number of competitors						
Monopoly	-0.004	-0.119	0.039	-0.098	-0.081	-0.142
	(0.053)	(0.094)	(0.067)	(0.153)	(0.078)	(0.127)
1-3 competitors	Base group		Base group		Base group	
4 or more competitors	-0.013	0.010	-0.021	0.046	-0.004	-0.030
	(0.016)	(0.033)	(0.020)	(0.049)	(0.024)	(0.046)
Loan's characteristics						
Collateral		-0.082**		-0.126**		-0.071*
		(0.034)		(0.059)		(0.0423)
Unprofitable in 2001	0.019	0.086†	0.017	0.233**	0.016	0.038
	(0.025)	(0.055)	(0.041)	(0.109)	(0.031)	(0.063)
$\rho_{\epsilon\vartheta}$ (std. Error)	-0.56† (0.323)		-0.83 (0.34)		-0.018 (0.60)	
Wald test	3.047		5.95**		0.0009	
Obs.	4537		2265		2298	
Censored obs.	2861		1561		1311	

Notes: i. †, *, ** and *** represent 15, 10, 5 and 1% significance, respectively.

ii. Robust standard errors are in parentheses.

iii. $\frac{d\text{Prob}[Loan=1]}{dZ}$ is the marginal effects of changes in Z on the probability of having a loan at the mean values. $\frac{d\text{Prob}[Soft|Loan=1]}{dX1}$ is the marginal effects of changes in $X1$ on the probability of expecting an extension of the term of the loan in case of trouble given that a loan is granted.

iv. Variables included in the *Loan* equation and in the $Soft$ equation are the same variables that are included in the *Loan* equation and in the $Soft$ equation of the bivariate probit with censoring presented in Table 3.3, respectively.

3.5 Do firms that (believe they) have a soft loan (will) behave differently?

We have assumed that $Soft$ really measures soft budgets, i.e. expectations are perfect. But it might reflect managers' erroneous expectations. Nevertheless, even if expectations are erroneous, it is expectations that lead to inefficient enterprise decisions. So it is interesting to study if managers' expectations to have a SBC influence firms' behaviors. Following Kornai *et al.* (2003, pp.1105-1106) and Kornai (1998, p.535), the SBC syndrome has at least three effects. i) First, if the firm is sure it will be rescued in case of trouble, so it expects that the firm's survival is assured, its pursuit of profits growth will be feebler, because it needs to strive less hard to survive. ii) Second, the market mechanism and competition perform a process of natural selection and the introduction of new products, new technologies and new methods of organization is necessary at least to survive and, in the best of the case, to win new markets. If managers expect to be rescued, there will be a weakening of the drive to innovate and develop new technologies and products. iii) Third, if the firm is sure it will be rescued in case of trouble, it will become less responsive to the prices of its inputs.

Using only the BEEPS 2002 does not permit to test i) if the expectation to have a soft loan has an impact on the profitability of the firm. Indeed, we know from the BEEPS 2002 survey if the firm was profitable in 2001, but the expectation to have a soft loan is in the first half of 2002 (when the survey was conducted). Similarly, it is very difficult to test ii) if the expectations to have a soft loan weaken the incentives to innovate. We know from BEEPS 2002 how much the company has spent on research and development and marketing as a percent of the average annual sales of the firm since 1998. So in the best of the case, we can say if a firm that expects to have a soft loan (in 2002) has spent less on research and development and marketing (since 1998). But it is not the same as claiming that expectations have an impact on the effort to innovate and to win new markets.

However, the BEEPS 2002 survey permits to test if iii) the firm's expectation to have a soft loan influences the price responsiveness because we know how the firm *will* respond if its main supplier of material input increases its supply price. More precisely, the question is the following:

> *If the main supplier of your main material input increased its supply price by 10% above what you pay at present (after allowing for inflation), how would you respond assuming that alternative suppliers if any left prices and other terms unchanged?* [1] *Purchase the same amount of the main material input from the existing main supplier*, [2] *Continue most of the purchases from the existing main supplier,* [3] *Purchase most of this material input from alternative suppliers, but continue some purchases from the existing main supplier,* [4] *Purchase all of this material input from alternative suppliers.*

Thus, the price responsiveness is examined by considering the variable PR. $PR_i = 0$ if the firm i says it will not be responsive to prices, i.e. if [1] it will purchase the same amount of the main material from the main supplier or if [2] it will continue most of the purchases from the existing main supplier. In these two cases, the firm is not responsive to the prices of its inputs. $PR_i = 1$ if the firm i will purchase [3] most or [4] all of its material input from alternative suppliers.

Of course, PR is only a self-reported information on a potential behavior; it is not a fact. But if the variable $Soft$ reflects an important element of reality, a firm that expects its bank will not engage legal proceedings if it falls behind in its bank repayments is also less likely to say it will purchase most of (or all) its material inputs from alternative suppliers if the price increases. Formally, we have a probit equation which is:

$$PR_i = (Soft_i\alpha + V_i\delta + \nu_i > 0) \tag{3.9}$$

where V_i is a vector of control variables and ν_i the perturbation term. This underlying relationship between PR and $Soft$ is not always observed. Rather the

relationship is observed if:

$$Loan_i = (Z_i\gamma + \eta_i > 0) \tag{3.10}$$

By assumption, $\text{Var}(\nu_i) = \text{Var}(\eta_i) = 1$ and $Cov(\nu_i, \eta_i) = \rho_{\nu\eta}$.

There are two probabilities of interest. The first one is the probability of changing supplier should the current supplier increase its price given that the firm has a soft loan, which is:

$$\text{Prob}[PR_i = 1|Soft_i = 1, Loan_i = 1] = \frac{\Phi_2(\alpha + V_i\delta, Z_i\gamma, \rho_{\nu\eta})}{\Phi(Z_i\gamma)} \tag{3.11}$$

The second one is the probability of changing supplier should the current supplier increase its price given that the firm has a "hard" loan, which is:

$$\text{Prob}[PR_i = 1|Soft_i = 0, Loan_i = 1] = \frac{\Phi_2(V_i\delta, Z_i\gamma, \rho_{\nu\eta})}{\Phi(Z_i\gamma)} \tag{3.12}$$

The difference in price responsiveness between those that have a soft loan and those that have a hard loan is, then,

$$\text{Prob}[PR_i|Soft_i = 1, Loan_i = 1] - \text{Prob}[PR_i|Soft_i = 0, Loan_i = 1] \tag{3.13}$$

Before to step further and present the results (in Table 3.6), we believe it is important to discuss about some important control variables that might determine PR. The fact that a firm will (or will not) change of main supplier in equation 3.9 is not only due to the manager's expectation to have a soft loan. First we control for the number of suppliers of the firm's main material input. Indeed if it has only one supplier the firm is less likely to change. Second, we control for the percent of sales in 2001 lost due to delivery delays from the material input suppliers. *Ceteris paribus*, if the percent of sales lost is important, the firm is more likely to change of supplier. Lastly, we include a dummy variable that equals one if the firm is

Table 3.6: Does a firm that expect to have a soft loan is less likely to change of main supplier if the current one increases its supply price by 10%?
$\text{Prob}[PR_i|Soft_i = 1, Loan_i = 1] - \text{Prob}[PR_i|Soft_i = 0, Loan_i = 1]$

	[A]	[B]	[C]	[D]	[E]	[F]	[G]
Soft	-0.051*	-0.047*	-0.052*	-0.050*	-0.049*	-0.051*	-0.051*
	(0.029)	(0.028)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)
Number of suppliers of the firm's main material input							
None	-0.003	0.012	-0.002	-0.022	-0.001	0.0009	-0.002
	(0.105)	(0.103)	(0.105)	(0.106)	(0.104)	(0.106)	(0.105)
1-3 suppliers	-0.208***	-0.216***	-0.209***	-0.212***	-0.211***	-0.210***	-0.210***
	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)
4 or more suppliers				Base group			
Percent of sales in 2001 lost due to delievery delays from the material input suppliers	-0.352		-0.349	-0.302	-0.294	-0.358	-0.358
	(0.276)		(0.276)	(0.276)	(0.276)	(0.276)	(0.275)
Business association	-0.013	-0.009		-0.0075	-0.015	-0.014	-0.013
	(0.032)	(0.031)		(0.031)	(0.031)	(0.031)	(0.031)
Overdue payment	0.088**	0.085**	0.087**		0.085**	0.085**	0.089**
	(0.037)	(0.036)	(0.036)		(0.036)	(0.037)	(0.037)
Main shareholder							
Individual	0.107**	0.108**	0.108**	0.104**		0.106**	0.107**
	(0.047)	(0.046)	(0.047)	(0.047)		(0.047)	(0.047)
Family	0.057	0.067	0.057	0.055		0.056	0.057
	(0.064)	(0.062)	(0.064)	(0.063)		(0.063)	(0.063)
Domestic company	0.029	0.034	0.028	0.029		0.029	0.030
	(0.058)	(0.057)	(0.058)	(0.057)		(0.058)	(0.058)
Foreign company		Base group				Base group	
Managers	0.180**	0.175**	0.182**	0.170**		0.180**	0.180**
	(0.072)	(0.079)	(0.079)	(0.079)		(0.078)	(0.079)
Employees	-0.034	-0.013	-0.032	-0.028		-0.034	-0.034
	(0.081)	(0.078)	(0.080)	(0.080)		(0.080)	(0.081)
State	0.139***	0.132**	0.140***	0.139***		0.139***	0.141***
	(0.052)	(0.051)	(0.052)	(0.051)		(0.051)	(0.052)
Others	0.132**	0.123**	0.133**	0.129**		0.131**	0.132**
	(0.060)	(0.060)	(0.060)	(0.059)		(0.060)	(0.060)
$\rho_{\nu\eta}$ (std. error)	0.305 (0.226)	0.291 (0.225)	0.316 (0.224)	0.257 (0.227)	0.472** (0.205)	0.276 (0.251)	0.395†(0.245)
Wald test	1.821	1.672	1.990	1.281	5.301	1.209	2.599
Obs. censored	1855	1855	1855	1855	1855	1775	2861
obs.	3297	3331	3297	3298	3297	3217	4303

Notes: i. †, *, ** and *** represent 15, 10, 5 and 1% significance, respectively.
ii. Robust standard errors are in parentheses.
iii. Other control variables included in the PR equation of all models: the firm's size, the number of competitors, the customers, a dummy variable that equals 1 if the firm was unprofitable in 2001, the Collateral variable, the interest rate, the financing source, the Manager education and age dummies, the sector of activity and country dummies.
iv. Control variables included in the selection equation of models [A]-[E] and [G]: the set of dummy variables that depicts the main shareholder, the Firm's size variables, the number of competitors variables, the customers, a dummy variable that equals 1 if the firm was unprofitable in 2001, External audit, IAS, Training, the Manager education and age dummies, the sector of activity and country dummies.
v. Control variables included in the selection equation of model [F]: the set of dummy variables that depicts the main shareholder, the Firm's size variables, the number of competitors variables, the customers, a dummy variable that equals 1 if the firm was unprofitable in 2001, External audit, IAS, Training, the Manager education and age dummies, the sector of activity and country dummies, as well as the set of dummy variables that describes the number of suppliers of the firm's main material input (None, 1-3, or more than 4), the percent of sales in 2001 lost due to delivery delays from the material input suppliers, a dummy variable that equals 1 if the firm has ever had to resolve an overdue payment, and a dummy variable that equals 1 if the firm is member of business association.
vi. Variable excluded in model [B]: Percentage of sales in 2001 lost due to delivery delays; in model [C]: Member of a business association; in model [D]: a dummy variable that equals 1 if the firm has ever had to resolve an overdue payment; in model [E]: the set of dummy variables that depicts the main shareholder.
vii. Models [A]-[F] are estimated with the used sample and model [G] with the BEEPS II sample. For the difference between these two samples, see subsection 3.4.1 and Table 3.1.

member of a business association, zero otherwise. By doing so, we take into account the argument of Johnson *et al.* (2002, p.223). According to them, firms have more

information about suppliers with whom they deal and they are therefore willing to pay more to an incumbent supplier than to one with whom they have never worked. However, these authors argue that members of an association are more likely to abandon their incumbent supplier because the association might serve to make an inquiry on a potential supplier's reliability. All of the regressions reported on Table 3.6 also include the control variables used in the previous section. A list of the control variables whose effects are not presented in the columns are reported in the notes of Table 3.6. Similarly, we provide a list of the variables included in the selection equation 3.10 (Notes iii., iv. and v.).

Table 3.6 presents some estimates of equation 3.13. The column [A] is an estimate of equation 3.13 with all the control variables previously depicted. In columns [B]-[E], we exclude some important control variables. For a firm that has obtained a loan, a soft loan decreases the probability of purchasing the main material input from an alternative supplier by between 4.7-5.2 percentage points if the current supplier increases its supply price by 10 percent.

Remark that in columns [A]-[E], the important control variables are only included in the PR equation. However, these variables can be included in the *Loan* equation (as we did in Table 3.A3). Thus, to avoid any doubts, these variables are also included in the selection equation of model [F]. Furthermore, these results are obtained with the sample of loan applicants (that is the "used sample"). There is no reason to exclude of our analysis firms that are not loan applicants. Consequently, in column [G], all the firms are included. (In other words, we use the BEEPS II sample). We still find that a firm that obtains a soft loan is 5.1 percentage points less likely than a firm that obtains a hard loan to purchase its main input from an alternative supplier if the current one increases its price by 10 percent.

3.6 Conclusion

This empirical chapter considers that the SBC syndrome occurs when a bank cannot commit to hold an enterprise to a fixed initial budget and/or the timing of repayment. Five results seem to be robust. First, managers' expectations to have a soft loan are lower when the initial financing requires collateral. Second, the probability of having its loan application accepted as well as the probability of expecting an extension in case of trouble are higher for a large firm. The third conclusion might seem surprising: being a state firm decreases the probability of having its loan application accepted. Furthermore, they are not more likely than foreign firms to expect an extension in case of trouble, except in the CIS countries. Fourth, firms owned by employees in the CIS countries are more likely to anticipate an extension if they fall behind in their bank repayments. Finally, managers of firms which were in financial distress in the recent past are more likely to believe that the bank will not engage in legal proceedings to take possession of assets if they fall behind in their bank repayments, especially in the CIS.

We conclude with two words of caution. First, concerning the no significance of the ownership of banks, our results are no more than suggestive because we do not really know if the main financing source is the bank which grants the loan. The second issue is whether or not our variable $Soft$ really measures soft budgets, resulting in inefficient enterprise decisions. We provide some results that suggest that it does: if a manager believes his firm will obtain an extension of loan in case of trouble, he also answers that he will purchase his main material input from his existing main supplier, even if the latter increases its supply price. So he says that he will be less price responsive. However, the validity of survey evidence concerning potential behaviors rather than facts might be in question. In order to test whether the soft budgets lead to efficiency losses, we would need a true time series dimension. This remark highlights that we need more surveys specifically designed for studying the determinants of the SBC phenomenon and how the behavior of firms is distorted

by anticipations. It might open a wide field for further research.

3.A Appendix of chapter 3: Additional results

Table 3.A1: Sensitivity of the marginal effects (and $\rho_{\epsilon\eta}$) when we exclude some explanatory variables

	[A]		[B]		[C]	
	$\frac{d\Pr[Loan=1]}{dZ}$	$\frac{d\Pr[Soft=1\|Loan=1]}{dX1}$	$\frac{d\Pr[Loan=1]}{dZ}$	$\frac{d\Pr[Soft=1\|Loan=1]}{dX1}$	$\frac{d\Pr[Loan=1]}{dZ}$	$\frac{d\Pr[Soft=1\|Loan=1]}{dX1}$
Main shareholder						
Individual	-0.008	0.019	0.026	0.034	0.018	0.023
	(0.023)	(0.043)	(0.024)	(0.043)	(0.023)	(0.043)
Family	0.050†	-0.045	0.091***	-0.031	0.075**	-0.039
	(0.032)	(0.058)	(0.032)	(0.058)	(0.032)	(0.058)
Domestic company	0.16***	-0.015	0.153***	-0.015	0.151***	-0.016
	(0.028)	(0.053)	(0.029)	(0.053)	(0.029)	(0.053)
Foreign company	Base group		Base group		Base group	
Managers	-0.031	0.053	-0.005	0.069	-0.002	0.070
	(0.044)	(0.091)	(0.044)	(0.092)	(0.044)	(0.092)
Employees	0.086**	0.107†	0.080*	0.105	0.081**	0.110†
	(0.039)	(0.075)	(0.041)	(0.076)	(0.040)	(0.075)
State	-0.013	0.042	-0.052*	0.029	-0.054*	0.033
	(0.028)	(0.054)	(0.028)	(0.053)	(0.028)	(0.054)
Others	0.013	0.051	0.006	0.052	-0.005	0.053
	(0.034)	(0.064)	(0.035)	(0.064)	(0.035)	(0.064)
Firm's size						
Employees<50			-0.192***	-0.094***	-0.20***	-0.106***
			(0.017)	(0.033)	(0.017)	(0.032)
50≤Employees<250			Base group		Base group	
Employees≥250			0.092***	-0.013	0.091***	-0.007
			(0.019)	(0.036)	(0.019)	(0.037)
Number of competitors						
Monopoly	-0.037	-0.116			-0.064	-0.117
	(0.057)	(0.094)			(0.059)	(0.094)
1-3 competitors	Base group				Base group	
4 or more competitors	-0.041**	0.009			-0.035**	0.006
	(0.017)	(0.033)			(0.018)	(0.033)
Loan's characteristics						
Collateral		-0.078**		-0.080**		-0.081**
		(0.034)		(0.034)		(0.034)
Unprofitable in 2001	-0.023	0.086†	-0.043†	0.078†	-0.038	0.082†
	(0.027)	(0.055)	(0.028)	(0.054)	(0.027)	(0.055)
ρ (std. error)	-0.504** (0.22)		-0.416 (0.318)		-0.488† (0.312)	
Wald test	4.835		1.711		2.44	
Obs. censored	1855		1855		1855	
Obs.	3531		3531		3531	
Notes	Specification of Table 3.3 with Firm's size variables excluded		Specification of Table 3.3 with Number of competitors variables excluded		Specification of Table 3.3 with Manager age and education dummies excluded	

Notes: i. †, *, ** and *** represent 15, 10, 5 and 1% significance, respectively.
ii. Robust standard errors are in parentheses.

Table 3.A2: Marginal effects for CIS and non-CIS firms

	CIS		Non-CIS	
	$\frac{d\Pr[Loan=1]}{dZ}$	$\frac{d\Pr[Soft=1\|Loan=1]}{dX1}$	$\frac{d\Pr[Loan=1]}{dZ}$	$\frac{d\Pr[Soft=1\|Loan=1]}{dX1}$
Main shareholder				
Individual	-0.005	0.063	0.048†	-0.013
	(0.031)	(0.079)	(0.032)	(0.056)
Family	0.014	-0.042	0.115***	-0.073
	(0.051)	(0.128)	(0.038)	(0.069)
Domestic company	0.182***	0.046	0.134***	-0.042
	(0.042)	(0.080)	(0.037)	(0.067)
Foreign comp.		Base group		Base group
Managers	0.050	0.155†	-0.066	-0.064
	(0.062)	(0.107)	(0.062)	(0.112)
Employees	0.114**	0.202***	0.006	-0.012
	(0.046)	(0.077)	(0.0656)	(0.108)
State	-0.055†	0.127†	-0.056	-0.037
	(0.037)	(0.087)	(0.040)	(0.068)
Others	-0.031	0.236**	0.038	0.018
	(0.050)	(0.100)	(0.045)	(0.074)
Firm's size				
Employees<50	-0.21***	-0.122**	-0.189***	-0.096**
	(0.023)	(0.050)	(0.023)	(0.044)
50≤Employees<250		Base group		Base group
Employees≥250	0.056*	-0.007	0.143***	-0.006
	(0.028)	(0.073)	(0.023)	(0.048)
Number of competitors				
Monopoly	-0.031	-0.059	-0.099	-0.140
	(0.038)	(0.111)	(0.089)	(0.126)
1-3 competitors		Base group		Base group
4 or more competitors	-0.045†	0.044	-0.025	-0.029
	(0.023)	(0.056)	(0.026)	(0.046)
Loan's characteristics				
Collateral		-0.124**		-0.070*
		(0.056)		(0.042)
Unprofitable in 2001	-0.016	0.221**	-0.053†	0.043
	(0.046)	(0.104)	(0.033)	(0.063)
Obs. censored		1039		816
Obs.		1740		1791
Notes	Specification of Table 3.3 with Manager age and education dummies excluded, and considering only CIS countries		Specification of Table 3.3 with Manager age and education dummies excluded, and considering only Non-CIS countries	

Notes: i. †, *, ** and *** represent 15, 10, 5 and 1% significance, respectively.
ii. Robust standard errors are in parentheses.

Table 3.A3: Robustness checks: Sensitivity of the marginal effects when we include additional explanatory variables

	$\frac{d\Pr[Loan=1]}{dZ}$	$\frac{d\Pr[Soft=1\|Loan=1]}{dX1}$
Main shareholder		
Individual	0.054**	0.039
	(0.026)	(0.048)
Family	0.112***	-0.044
	(0.035)	(0.063)
Domestic company	0.182***	-0.018
	(0.031)	(0.059)
Foreign company	Base group	
Managers	-0.021	0.022
	(0.051)	(0.106)
Employees	0.086*	0.093
	(0.044)	(0.084)
State	-0.053*	0.036
	(0.030)	(0.060)
Others	0.032	0.073
	(0.038)	(0.070)
Number of suppliers of the firm's main material input		
None	-0.090**	0.069
	(0.046)	(0.105)
1-3	Base group	
More than 4	-0.090**	0.094***
	(0.046)	(0.034)
Firm's size		
Employees<50	-0.173***	-0.105***
	(0.019)	(0.036)
50≤Employees<250	Base group	
Employees≥250	0.090***	-0.043
	(0.021)	(0.040)
Number of competitors		
Monopoly	-0.079	-0.109
	(0.067)	(0.110)
1-3 competitors	Base group	
4 or more competitors	-0.046**	0.013
	(0.019)	(0.035)
Unprofitable in 2001	-0.051*	0.065
	(0.030)	(0.060)
Percent of sales in 2001 lost due to delivery delays from the material input suppliers	0.299**	-0.332
	(0.125)	(0.284)
Loan's characteristics		
Collateral		-0.085**
		(0.038)
Interest rate		-0.137
		(0.132)
Overdue payment	0.119***	0.030
	(0.017)	(0.035)
Business association	0.118***	0.004
	(0.0156)	(0.031)
$\rho_{\epsilon\eta}$ (std.error)	-0.553† (0.361)	
Wald test	2.346	
Obs. censored	1775	
Obs.	3241	

Notes: i. †, *, ** and *** represent 15, 10, 5 and 1% significance, respectively.

ii. Robust standard errors are in parentheses.

iii. The estimators are marginal effects at the means values. The estimators are associated with a bivariate probit with censoring with the same explanatory variables than in Table 3.3 plus the following additional variables: a set of dummy variables that describes the number of suppliers of the firm's main material input (None, 1-3, or more than 4), the percent of sales in 2001 lost due to delivery delays from the material input suppliers, a dummy variable that equals 1 if the firm has ever had to resolve an overdue payment, a dummy variable that equals 1 if the firm is member of business association, and the rate of interest. All these additional variables are included in both the $Loan$ and the $Soft$ equations, except the rate of interest that is only included in the $Soft$ equation.

Table 3.A4: Robustness checks: Marginal effects with an alternative definition of $Soft$

	$\frac{d\Pr[Loan=1]}{dZ}$	$\frac{d\Pr[Soft=1\|Loan=1]}{dX1}$
Main shareholder		
Individual	0.004	0.006
	(0.019)	(0.023)
Family	0.085**	-0.050
	(0.038)	(0.057)
Domestic company	0.139***	-0.018
	(0.030)	(0.039)
Foreign company	Base group	
Managers	0.0133	-0.099†
	(0.082)	(0.065)
Employees	0.077*	0.064
	(0.040)	(0.051)
State	-0.070**	-0.042
	(0.029)	(0.040)
Others	0.022	-0.011
	(0.051)	(0.039)
Firm's size		
Employees<50	-0.186***	-0.043†
	(0.0153)	(0.027)
50<Employees<250	Base group	
Employees>250	0.086***	0.044†
	(0.020)	(0.030)
Number of competitors		
Monopoly	-0.064*	0.041
	(0.033)	(0.089)
1-3 competitors	Base group	
4 or more competitors	-0.023	-0.035†
	(0.023)	(0.023)
Loan's characteristics		
Collateral		-0.051**
		(0.024)
Unprofitable in 2001	-0.035	0.008
	(0.038)	(0.040)
$\rho_{\epsilon\eta}$ (std. error)	-0.365 (0.305)	
Walt test	1.43	
Obs. censored	1855	
Obs.	3531	
Notes	Specification of Table 3.3 with Manager education dummies excluded and an alternative definition of $Soft$	

Notes: i. †, *, ** and *** represent 15, 10, 5 and 1% significance, respectively.
ii. Robust standard errors are in parentheses.

Chapter 4

Banking system, fiscal externality and soft budget constraint in transition

4.1 Introduction

Transition economies began a strategy of fast reforms in the early 1990s: price liberalization, privatization and stabilization. It was widely held that this trinity would suffice to produce efficient market economies. However, some countries, especially those of the FSU, have witnessed persistent economic declines. Berkowitz and Li (2000), Litwack and Qian (1998), Roland and Verdier (2003) and Shleifer and Treisman (2000) among others emphasize that these transition economies have appeared to be in a trap of continual budgetary pressures and high taxation. In particular, Shleifer and Treisman (2000, pp.95-96) note that in Russia "*entrepreneurs complained about the bewildering number of taxes, whose aggregate rates, they suggested, added up to close to 100% of enterprise profits or even revenues.*" This problem is persisting in some countries of the FSU, as shown by Table 4.1. It presents the five transition countries with the highest value and the five transition countries with

the lowest value of the total tax rate expressed as a share of commercial profits that a typical medium-size company must pay for the fiscal year 2005.[1] Total tax rates are higher than 100% in Belarus and Uzbekistan. With so high tax rates, potential private entrepreneurs are discouraged to create their firms, or, if created, to search for new products. To a lesser extent, Russia is concerned, given that the total tax rate is 70%.

However, others have claimed that a crucial reason of the collapse of these economies is that lending markets are lemons. Commander *et al.* (2002) and Marin *et al.* (2000) provide empirical evidence that the lack of liquidity is an important problem for firms. Using a survey of 165 barter deals in Ukraine, Marin *et al.* (2000, pp.216-217) argue that it is the lack of liquidity, and not tax reasons, that is the main motivation behind the explosive increase of barter. Similarly, using a survey of 350 Russian firms, Commander *et al.* (2002) highlight that the lack of liquidity is problematic and that barter is to some extent a substitute for bank lending. Brana *et al.* (1999) and Huang *et al.* (2004) also show that banks tend to give preference to distressed firms in the FSU. The fact that credit to the real sector has declined substantially to the detriment of the best firms is all the more surprising since there has been a boom in the number of commercial banks in these countries, especially in Russia: the number of commercial banks increased from fewer than 100 in 1988 to about 2500 in 1998; It has stabilized around 1300 since the 1998 financial crisis, which is still impressive (Huang *et al.*, 2004, EBRD, 2005).

This chapter explains that if the lack of liquidity is an important problem for firms and that banks tend to give preferences to firms in trouble in the FSU, it is because of a high tax rate. More precisely, we argue that banks refuse to lend to firms, or lend only to bad firms, because of the government's use of fiscal means to support these bad firms that have a SBC. We first develop a simple framework that

[1] These data are from the Doing Business database (World Bank, 2006a). It provides objective measures of business regulation and their enforcement, records the tax that a typical medium-size company must pay or withhold in a given year. To make the data comparable concerning the tax rate across countries, several assumptions about the taxes are used. For a recent papers using a part of this database, one might read Djankov *et al.* (2006).

Table 4.1: Eastern European countries with the five highest and the five lowest total tax rate (% of profit) in 2005

Five highest	Five lowest
Belarus (186.1)	Latvia (42.6)
Uzbekistan (106.3)	Slovenia (39.4)
Tajikistan (87)	Serbia (38.9)
Russia (70)	Poland (38.4)
Kyrgyz Republic (68.8)	Croatia (37.1)

Notes: i. Source: World Bank (2006a)
ii. The levels of the total tax rate (% of profit) are reported after the countries, in percent. It measures the amount of taxes payable by the business expressed as a share of commercial profits. The total amount of taxes is the sum of all the different taxes payable after accounting for deductions and exemptions. The database is available at `http://www.doingbusiness.org`

explains both the fiscal externality and the misallocation of loans, the latter being the result of the former. This framework permits to derive some implications that are tested with data drawn from BEEPS III, developed jointly by the World Bank and the EBRD.

Table 4.2: Budgetary subsidies in Central and Eastern Europe (percent of GDP)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Belarus	n.a.	16.2	17.1	17.2	18.9	18.9	19.9	18.9	18.8	18.3
Romania	15.5	15.8	15.8	14.8	14.7	14.4	14.4	14	14.1	14
Russia	8.2	8.1	8.5	5.9	5.3	n.a.	n.a.	n.a.	n.a.	n.a.
Ukraine	5.9	6.5	6.4	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Hungary	3.8	3.9	3.2	3	2.2	2.4	2.4	2.5	2.4	3.8
Poland	1.1	0.8	3.3	2.9	2.5	2.2	2.3	2.4	2.5	3.6
Slovenia	1.9	1.4	1.4	1.5	1.6	1.5	1.4	1.2	1.5	n.a.

Notes: i. Sources: EBRD (1999, 2001, 2005) and Roland (2000).

It is clear that high tax rates in Russia, or in Belarus, are the results of important subsidies (compared to other transition economies) to loss-making firms (see Table 4.2 and Roland, 2000, pp.287-288). The SBC phenomenon is empirically analyzed by Kornai (2001) who highlights that this syndrome is an important cause of the persistent economic decline of countries of the FSU. At the beginning of transition, some

economists argued that the main cause of the SBC was state ownership, therefore privatization should have solved the problem.[2] The reality is often more cumbersome: in most of the FSU, policymakers have given away ownership and control of firms to managers to lean on them for supporting reforms. Thus, it is difficult for Belarusian, Russian or Ukrainian governments not to subsidize managers: the political capital that the governments have obtained by given away ownership to them would be lost (Hirschler, 2000, Ericson, 1999). Consequences are twofold. First, the banks anticipate that these firms will be bailed out by the government if they get into difficulty. Even if firms' managers expect to be rescued in case of trouble and strive less hard to survive, the possibility of bailout serves as an insurance. Thus, even if these banks are in the business of maximizing profit, they have incentives to grant loans to these firms. Second it does not create favorable conditions for the HBC sector. Low tax rate and credits to solve its liquidity problem are two necessary means to create good conditions for it (Kornai, 2000, p.51). If taxation, used to bail out the SBC firms, is too high, the HBC sector will be discouraged to conquer new markets or to introduce new products. Without good business opportunities, this HBC sector will aim exclusively at reducing the social cost of reforms and surviving. And, banks will not lend to these firms because of small opportunities of profit. So the HBC sector will have to turn to non-bank finance, such as barter.

Our objective in this chapter is to formalize that discussion and test it in an empirical study. Thus, the main contribution is to combine two strands of the economic literature on transition: models emphasizing the role of fiscal externality on transition trajectories (e.g., Berkowitz and Li, 2000, Roland and Verdier, 2003) and models emphasizing the misallocation of bank loans (Huang *et al.*, 2004), especially SBC models (Dewatripont and Maskin, 1995, Berglof and Roland, 1995). The basic story of all the models of fiscal externality is that taxes are raised in a way that inevitably burdens those firms that are the most successful. This in turn has a

[2] Kornai (2000) and Hoff and Stiglitz (2004) explain that a majority of economists believed that privatization would have permitted to create the required institutions of capitalism at the beginning of transition.

critical feedback effect. But none of these models refers to the SBC phenomenon. For Berkowitz and Li (2000), high tax rates are the result of a tragedy of commons on tax 'rights': government's tax rights are poorly defined because other state agencies can levy taxes too. When each tax agency unilaterally sets its tax rate on the common tax base, the economy sustains a low equilibrium where tax rates are high, firms engage in unofficial activity and the output is low. For Roland and Verdier (2003), if tax rates are too high, private producers prefer to become criminals. The model of Huang *et al.* (2004) focus on the problem of the misallocation of loans but totally neglect the problem of high tax rates to explain it. They consider that good quality firms face higher borrowing costs than bad quality firms because banks do not distinguish good credit risk firms from bad ones. As a result, good quality firms are more likely to use barter to solve their liquidity problems and bank loans are mainly allocated to bad firms.

This chapter is built upon the large SBC literature evolving from Dewatripont and Maskin (1995), in particular Berglof and Roland (1995).[3] There are, however, a number of important distinctions between our model and theirs. First, in the model of Dewatripont and Maskin (1995), a bank might have an intrinsic interest in refinancing a poor project. It will do so if it has enough liquidity. If it does not have enough liquidity, the bank can refinance the project by attracting a third party which provides funds against a share of the return. It reduces the bank's incentives to monitor the firm. As a consequence, refinancing might be unattractive. By contrast, in our model and in Berglof and Roland (1995), the banks have no intrinsic interest in refinancing. It is the government that has an interest *ex post* in keeping some firms that are unprofitable afloat. Our model captures the idea that the government serves as an insurance company for the SBC sector. Thus, the banks might prefer *ex ante* to finance the firms that have a SBC. Second, Berglof and Roland (1995) and

[3] Our model also uses an important feature of Brandt and Zhu (2001) who propose a bi-sectorial model with a state sector and a non-state sector to explain growth and inflation cycles in China. Our dichotomy between a HBC sector and a SBC sector is very similar. However, there is a subtle but important (as we will see) difference: in their model, the government uses the financial system to support the sector with a SBC, and in ours the fiscal system.

Dewatripont and Maskin (1995) assume that banks make take-it-or-leave-it-offer in negotiating financial terms, and thereby extract the entire verifiable output (so the firms have only the non verifiable private benefit); and banking competition is not modeled. On the contrary, we assume free entry in the banking sector and banks have an alternative opportunity for investing. As a consequence, the financial term is not the same for a firm of the SBC sector and for a firm of the HBC sector, and banks do not extract all the verifiable output of a good project. Third, the share of the verifiable output of a good project obtained by a firm is taxed by the government. The higher the tax rate, the higher the marginal return of its effort a firm has to concede, and the lesser the incentives to search for good projects. So if the tax rate is too high, the banks' alternative opportunity might give a higher expected payoff than the investment in the projects of firms. Firms of the SBC sector, however, might be less confronted to this problem because the government serves as an insurance.

The economic mechanisms highlighted in the model are tested in an empirical study. In a first step, we consider which firms are more likely to obtain subsidies in case of trouble. We especially find that these ones are not only state-owned and big enterprises but also members of lobbies.[4] Estimation of this enables us to derive a predicted probability of receiving subsidies in case of trouble. This predicted probability, as well as other variables suggested by our theory such as the tax rate that a representative firm has to pay, are used as explanatory variables in an econometric model of loan selection. After controlling for a variety of other micro or

[4] If the literature on lobby is growing, the empirical evidence is scarce and limited to developed countries. Recent exceptions for transition and developing economies are Campos and Giovannoni (2007) and Desbordes and Vauday (2007), but they do not study if firms that are members of lobbies are more likely to receive subsidies. Consequently, the empirical part of this chapter offers a limited but interesting contribution to the literature on lobby. Furthermore, the recent literature on SBC evolving from the dynamic commitment story *à la* Dewatripont and Maskin (1995) and static model *à la* Shleifer and Vishny (1994) does not relate the softness to the lobbying activity of managers contrary to older theories, like Goldfeld and Quandt (1988). Goldfeld and Quandt (1988, p.506) propose a model in which they assume that "*the bailouts* [...] *are a positive function of the amount employed of a specialized type of managerial labor* [...] *which does not appear in the production function but is particularly well suited to whining in the corridors of government departments*".

macro determinants (e.g., the rule of law) of the probability of obtaining a loan, we continue to find highly statistically significant effect and quantitatively important positive effect of the predicted probability of obtaining subsidies and important negative effect of the tax rate (or alternatively subsidies in percent of GDP).

The chapter is organized as follows. Section 4.2 presents our framework. Section 4.3 presents the econometric methodology and the data. Section 4.4 presents the results. Finally, section 4.5 offers a summary of the findings of the chapter.

4.2 The framework

In this section, we present our extension of the Dewatripont and Maskin (1995) framework to capture the fiscal externality. The economy is composed of two sectors: the sector with a SBC (the sector s), and the sector with a HBC (the sector h). Agents are risk neutral, i.e. they maximize expected profit.

4.2.1 Enterprises

There are two types of firms: firms belonging to the sector s (firms s) and those belonging to the sector h (firms h). Each firm is headed by a manager/owner. Managers' economic activity includes searching for projects. Firms have no initial endowments of capital and they must borrow 1 unit of funds to a bank to launch projects (so they inelastically demand one unit of funds). Following Dewatripont and Maskin (1995), firms' projects can be either good (g) or bad (b).

With an investment of 1 (so if the firm has obtained a loan), a good project yields a verifiable output of A_g in the next period. The bank receives $R(\leq A_g)$ (we determine the value of R in subsection 4.2.2). The government levies $\tau(A_g - R)$ to subsidize the bad projects of the firms s, with $\tau \in [0, 1]$ the tax rate. The manager receives the residual profit $(1-\tau)(A_g - R)$, as well as private (non taxable) benefits B_g. Following Kornai *et al.* (2003), the latter includes managerial perquisites, power, prestige and the like. Therefore, the manager's per unit return from a good project

is:

$$\pi_g = (1-\tau)(A_g - R) + B_g \tag{4.1}$$

By contrast, a bad project remains incomplete and so yields no output. However, if the government rescues the firm through subsidies, the project is completed. All of the output of the project $A_b(< 1)$ will go toward debt repayment to the initial loan of the bank. And the return from a bad project for a manager is:

$$\pi_b = \begin{cases} B_b > 0 & \text{if the project is subsidized.} \\ B_l = 0 & \text{if the project is not subsidized.} \end{cases} \tag{4.2}$$

Following the SBC literature, $B_g \geq B_b > B_l = 0$. These inequalities make sense. With a bad project that is not subsidized (i.e. that is terminated), a manager's private benefit is lower than with a subsidized (so completed) bad project ($B_b > B_l = 0$) if we imagine that a manager can extract more from a project the longer it continues; or because reputation is enhanced if the project is completed. $B_g \geq B_b$ makes sense because a good project gives a higher reputation than a bad project even if completed.

The probability of finding a good project is given by $Pr(A_g|a_j) = a_j$, with $a_j \in [0,1]$ the manager's search effort of a firm belonging to the sector j ($j = \{h, s\}$).

However, if the manager searches, he occurs a disutility of effort $\psi(a_j)$. As a_j rises so does the cost of search effort. We make the following assumption concerning the cost of effort $\psi(.)$.

Assumption 1 *i)* $\psi'(a_j) > 0$, $\psi''(a_j) > 0$.
ii) $\psi(0) = \psi'(0) = 0$, *and* $\psi(1) = \psi'(1) = +\infty$
iii) $\psi'''(a_j) > 0$

Parts i) and ii) of assumption 1 are traditional hypotheses necessary to have an interior solution. Part iii) can be dropped without drastically changing the results; however, this hypothesis makes some proofs somewhat simpler.

Consequently, the manager j's ex-ante expected return is:

$$\pi_j^e = a_j\pi_g + (1 - a_j)\pi_b - \psi(a_j)$$

The manager/owner of each firm decides of the level of effort depending of its expectations to be refinanced or not in case of trouble. The manager's optimal choice of effort when he expects that he will be refinanced in case of trouble, i.e. a manager who has a SBC (a manager of type s), is:

$$a_s^* = \arg\max_{a_s} a_s[(1 - \tau)(A_g - R) + B_g] + (1 - a_s)B_b - \psi(a_s)$$

and a_s^* satisfies:[5]

$$(1 - \tau)(A_g - R) + B_g - B_b - \psi'(a_s^*) = 0 \tag{4.3}$$

Equation 4.3 gives the best response function of a manager s, i.e. $a_s^* = a_s^*(\tau, R)$.

The manager's optimal choice of effort when he expects that he will not be refinanced in case of trouble, i.e. a manager with a HBC (a manager of type h), is[6]:

$$a_h^* = \arg\max_{a_h} a_h[(1 - \tau)(A_g - R) + B_g] - \psi(a_h)$$

so a_h^* satisfies:

$$(1 - \tau)(A_g - R) + B_g - \psi'(a_h^*) = 0 \tag{4.4}$$

Equation 4.4 gives the best response function of a manager h, i.e. $a_h^* = a_h^*(\tau, R)$.

And we obtain the lemma 1.

Lemma 1 $a_h^* > a_s^*$*: Ceteris paribus, the best response function of a manager* h *is always higher than the best response function of a manager* s*.*

Proof of lemma 1: see Appendix 4.A.

[5] Note that this first-order condition (FOC) is valid because $\tau \leq 1$ Indeed, the FOC is valid provided that $\tau \leq \frac{A_g - R + B_g - B_b}{(A_g - R)}$, and $\tau \leq 1 \leq \frac{A_g - R + B_g - B_b}{(A_g - R)}$.

[6] Like for managers s this FOC is valid because $\tau \leq 1 \leq \frac{A_g - R + B_g}{A_g - R}$.

Lemma 1 is the first reason explaining why an agent makes more or less effort to search for good projects. It says that *ceteris paribus* a manager s makes lower effort than a manager h, because even if a manager s obtains a bad project, he has a strictly positive private benefit B_b contrary to a manager h. It illustrates the Kornai (1998, p.535)'s claim that "*if the budget constraint is soft, so that's firm's survival is assured, its pursuit of profit growth will be feebler, because it needs to strive less hard to survive.*"

The second and the third reasons, resumed in lemma 2, are due to the tax rate (τ) and the share of the verifiable output A_g that a bank extracts (R).

Lemma 2 *i)* $\frac{\partial a_j^*}{\partial \tau} < 0$*: The optimal level of effort* a_j^*, $\forall j = \{h, s\}$, *is decreasing in* τ.
ii) $\frac{\partial a_j^*}{\partial R} < 0$ *and* $\frac{\partial^2 a_j^*}{\partial R^2} < 0$*: The optimal level of effort* a_j^*, $\forall j = \{h, s\}$, *is decreasing and concave in* R.

Proof of lemma 2: see Appendix 4.A.

Lemma 2 illustrates the fact that if an agent has to concede a part of the marginal return of his effort, he has less incentives to search for good projects.

Figures 4.1 and 4.2 are graphical representations of these two lemma. Figure 4.1 represents the best response functions of managers s and h in function of R. For graphical representation we have used the following function of effort: $\psi(a_j) = \frac{a_j^2}{1-a_j}$, $\forall j = \{h, s\}$. Note that this function has the properties of the general function of effort presented in assumption 1.We will use this function all along the chapter for figures. Figure 4.2 represents the variation in the best response function of a manager of type h when the tax rate (τ) increases.

Before to step further and study when firms h and s obtain loans or do not, it is useful for the next sections to understand how the expected payoffs of firms h and s evolve in function of R. Taking partial derivatives of the expected payoffs with respect to R yield the following results:

Lemma 3 $\frac{\partial \pi_j^e}{\partial R} < 0$*: the expected payoff of a firm* j, $\forall j = \{h, s\}$, *is decreasing in* R.

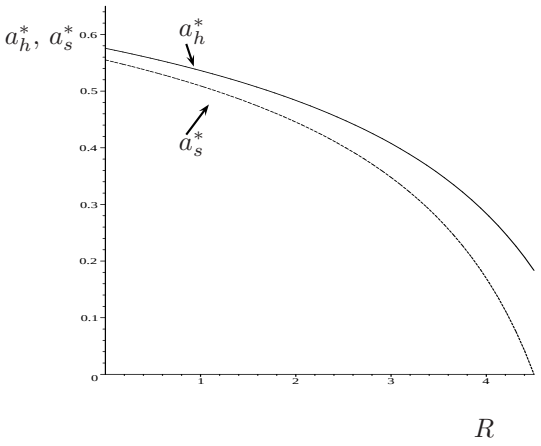

Figure 4.1: Best response functions of a manager of type h and a manager of type s.
Parameter values of the best response function of a manager h (in solid): $A_g = 4.25$; $B_g = 0.5$; $\tau = 0.1$.
Parameter values of the best response function of a manager s (in dash): $A_g = 4.25$; $B_g = B_b = 0.5$; $\tau = 0.1$.

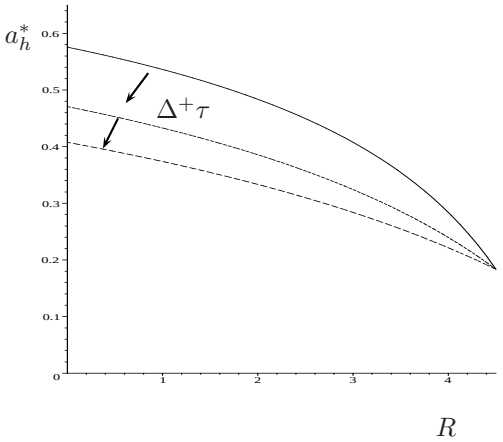

Figure 4.2: Impact of an increase in the tax rate ($\Delta^+\tau$) on the best response function of a manager. The case of a manager h.
Parameter values of the best response function in solid: $A_g = 4.25$; $B_g = 0.5$; $\tau = 0.1$
Parameter values of the best response function in dash: $A_g = 4.25$; $B_g = 0.5$; $\tau = 0.4$.
Parameter values of the best response function in dot: $A_g = 4.25$; $B_g = 0.5$; $\tau = 0.7$.

Proof of lemma 3: see Appendix 4.A.

This result implies that if there are various banks, and each bank proposes a

different R, the firm chooses to borrow to the bank that proposes the lowest R. This result is trivial but useful for next sections.

4.2.2 The banking system

In the preceding subsection, we have considered the best response functions of firms h and s. In this subsection, we study banks' behavior. More precisely we determine i) when firms h (and s) obtain loans or do not; ii) the value of R specified in the contract for a firm h (s) which has obtained a loan, denoted $\widetilde{R}_h^*$ ($\widetilde{R}_s^*$); iii) $\widetilde{a}_h^*$ ($\widetilde{a}_s^*$) the level of effort that a firm h (s) makes when the term of the contract between the bank and the firm h (s) is $\widetilde{R}_h^*$ ($\widetilde{R}_s^*$).

We first assume that banks are able to identify which firms will receive subsidies in case of trouble (firms s), and which firms will not (firms h). The banks know the firms s' and the firms h's best response functions, i.e. a_s^* and a_h^*, respectively. However, managers' effort can not be contracted for because information concerning a manager's effort is not verifiable (i.e. not admissible in court). If a firm of type j, with $j = \{h, s\}$, obtains a loan, the contract specifies $\widetilde{R}_j^*$ the value of R, i.e. what receives the bank if the firm of type j generates a good project.

Following Huang *et al.* (2004), we also assume free entry in the banking sector. Facing competition, each bank makes its investment decision based on expected returns. We assume that banks have an alternative opportunity for investing, e.g., government securities like Huang *et al.* (2004) or a world capital market like Chang and Velasco (2001). The bank return of investing in government securities is $S_m \geq 1$.

4.2.2.1 The banks and the firms h

A bank lends to a firm h if and only if its expected payoff when it lends to a firm h is higher than or equal to its alternative opportunity, that is if $a_h^* R - 1 \geq S_m - 1 \Rightarrow a_h^* R \geq S_m$. Because of free entry in the banking sector, this condition is binding in

equilibrium. Let

$$\widehat{a}_h = \frac{S_m}{R} \tag{4.5}$$

be the minimum level of effort that a firm h has to make in order to obtain a loan. First, remark that $\frac{\partial \widehat{a}_h}{\partial R} = -\frac{S_m}{R^2} < 0$ and $\frac{\partial^2 \widehat{a}_h}{\partial R^2} = \frac{2S_m}{R^3} > 0$ so $\widehat{a}_h$ is decreasing and convex in R. Second, remember that a_h^* is decreasing and concave in R (lemma 2). Thus, there are three possible cases represented in figure 4.3: $\widehat{a}_h$ and a_h^* do not cross, they are tangent, or they cross twice.

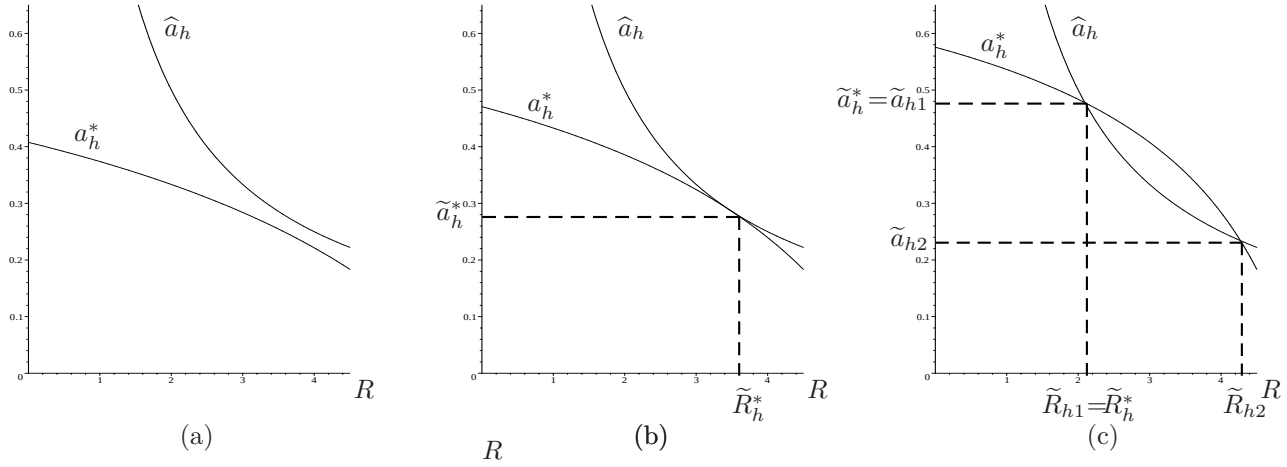

Figure 4.3: When does a firm h obtain a loan?
Parameter values of panel (a): $A_g = 4.25$; $B_g = 0.5$; $\tau = 0.70$; $S_m = 1$
Parameter values of panel (b): $A_g = 4.25$; $B_g = 0.5$; $\tau = \bar{\tau}_h \simeq 0.414$; $S_m = 1$
Parameter values of panel (c): $A_g = 4.25$;$B_g = 0.5$;$\tau = 0.1$; $S_m = 1$

In the first case (panel (a) of figure 4.3), $\widehat{a}_h$ and a_h^* do not cross. $\forall R$, $\widehat{a}_h > a_h^* \Rightarrow \forall R,\ S_m > a_h^* R$, so for all $R \in (S_m, A_g]$, a bank's alternative opportunity gives a higher expected payoff than the investment in the project of a firm h. Consequently, a bank always prefers to invest in the alternative opportunity (the firm might promise that it will make a level of effort of $\widehat{a}_h$ but it is not credible because the level of effort is nonverifiable).

In the second case (panel (b) of figure 4.3), $\widehat{a}_h$ and a_h^* are tangent. The difference between panel (b) and panel (a) relies on the fact that we consider a lower tax rate in (b). $\widehat{a}_h$ does not depend on τ (see equation 4.5) but a_h^* does, so a lower τ only shifts the curve a_h^* upward (see lemma 2). If τ decreases sufficiently, say to $\bar{\tau}_h$, there is one point of tangency between a_h^* and $\widehat{a}_h$, so there is only one $R \in (S_m, A_g]$ that

satisfies $a_h^* = \widehat{a}_h$, as panel (b) of figure 4.3 shows. In this case, a firm h obtains a loan and $\widetilde{R}_h^*$, the term specified in the contract, is the unique value of R that satisfies $a_h^* = \widehat{a}_h$. The reason is that when $\tau = \bar{\tau}_h$, a bank only agrees to grant a loan to a firm h if $R = \widetilde{R}_h^*$.[7] The firm h inelastically demands one unit of funds, so it accepts that the term specified in the contract is $\widetilde{R}_h^*$ (because it has no better opportunity).

Now, if τ decreases sufficiently such that $\tau < \bar{\tau}_h$, we are in the third case, represented in panel (c) of figure 4.3: $\widehat{a}_h$ and a_h^* cross twice. Let $(\widetilde{R}_{h1}, \widetilde{a}_{h1})$ and $(\widetilde{R}_{h2}, \widetilde{a}_{h2})$ the coordinates of the two points of intersection, with $\widetilde{R}_{h2} > \widetilde{R}_{h1}$. A bank agrees to grant a loan to a firm h for a $R \in [\widetilde{R}_{h1}, \widetilde{R}_{h2}]$, because $\forall R \in [\widetilde{R}_{h1}, \widetilde{R}_{h2}]$, $a_h^* \geq \widehat{a}_h \Rightarrow a_h^* R \geq S_m$. In this case, it is easy to see that a firm h obtains a loan and $\widetilde{R}_h^*$, the term specified in the contract, equals $\widetilde{R}_{h1}$, the lower bound of the interval $[\widetilde{R}_{h1}, \widetilde{R}_{h2}]$. This follows from free entry in the banking sector and lemma 3. Lemma 4 resumes and extends the discussion.

Lemma 4 *i) There is a threshold $\bar{\tau}_h$ such that a firm h obtains a loan if and only if*

$$\tau \leq \bar{\tau}_h \tag{4.6}$$

where $\bar{\tau}_h$ depends on the values of the following exogenous parameters: A_g, B_g and S_m.

ii) Assume that condition 4.6 is satisfied. There is at least one pair (R, a_h^*) that satisfies $a_h^* = \widehat{a}_h$. $\widetilde{R}_h^*$, the term of the contract between a firm h and a bank, is the lowest R that satisfies $a_h^* = \widehat{a}_h$. $\widetilde{a}_h^*$, the corresponding level of effort, is the highest a_h^* that satisfies $a_h^* = \widehat{a}_h$.

iii) $\frac{\partial \widetilde{R}_h^*}{\partial \tau}_{|\tau \leq \bar{\tau}_h} > 0$: As far as condition 4.6 is satisfied, the share of observable output that a bank will extract to a firm h is increasing in τ.

iv) $\frac{\partial \widetilde{a}_h^*}{\partial \tau}_{|\tau \leq \bar{\tau}_h} < 0$: As far as condition 4.6 is satisfied, the effort made by a firm h for a contract that specifies that the financial term of the loan is $\widetilde{R}_h^*$ is decreasing in τ.

[7] Indeed if $R = \widetilde{R}_h^*$, $\widehat{a}_h = a_h^* \Rightarrow a_h^* \widetilde{R}_h^* = S_m$, so the bank agrees to grant a loan to a firm h; but $\forall R \neq \widetilde{R}_h^*$, $\widehat{a}_h > a_h^* \Rightarrow S_m > a_h^* R$ so the bank prefers the alternative opportunity.

Proof of lemma 4: see Appendix 4.A.

4.2.2.2 The banks and the firms s

Now, let's consider firms s. When a firm s applies for a loan, the bank expects that the government will rescue this firm if it launched a bad project, and the final output of this project (A_b) will go toward debt repayment to the initial loan of the bank. Therefore, a bank lends to a firm s if and only if its expected payoff when it lends to a firm s is higher than or equal to its alternative opportunity, that is if $a_s^* R + (1 - a_s^*)A_b - 1 \geq S_m - 1 \Rightarrow a_s^* R + (1 - a_s^*)A_b \geq S_m$. So the minimum level of effort that a firm s has to make in order to obtain a loan is:

$$\widehat{a}_s = \frac{S_m - A_b}{R - A_b} \tag{4.7}$$

Like for $\widehat{a}_h$, $\widehat{a}_s$ is a continuous decreasing and convex function in R. Remark that for a given $R \in (S_m, A_g]$, $\widehat{a}_s$, the minimum level of effort that a bank asks to a firm s to have a loan, is lower than $\widehat{a}_h$, the minimum level of effort that a bank asks to a firm h to have a loan.[8] The reason is that the bank expects the government will be the guarantor of a firm s in trouble, so even if a firm s launches a bad project, the bank knows that it will obtain A_b. Consequently, the minimum level of effort that a firm s has to make in order to obtain a loan is lower than the minimum level of effort that a firm h has to do.

Like for firms h, there are three cases. There is a threshold $\bar{\tau}_s$, such that $\widehat{a}_s$ and a_s^* do not cross if $\tau > \bar{\tau}_s$. If $\tau = \bar{\tau}_s$, $\widehat{a}_s$ and a_s^* are tangent. Lastly, if $\tau < \bar{\tau}_s$, $\widehat{a}_s$ and a_s^* cross twice.

Lemma 5 *i) There is a threshold $\bar{\tau}_s$ such that a firm s obtains a loan if and only if*

$$\tau \leq \bar{\tau}_s \tag{4.8}$$

[8] $\widehat{a}_h \geq \widehat{a}_s$ if and only if $\frac{S_m}{R} \geq \frac{S_m - A_b}{R - A_b} \Leftrightarrow R \geq S_m$.

where $\bar{\tau}_s$ depends on the values of the following exogenous parameters: A_g, B_g, S_m, B_b and A_b.

ii) Assume that condition 4.8 is satisfied. There is at least one pair (R, a_s^*) that satisfies $a_s^* = \widehat{a}_s$. $\widetilde{R}_s^*$, the term of the contract between a firm s and a bank, is the lowest R that satisfies $a_s^* = \widehat{a}_s$. $\widetilde{a}_s^*$, the corresponding level of effort, is the highest a_s^* that satisfies $a_s^* = \widehat{a}_s$.

iii) $\frac{\partial \widetilde{R}_s^*}{\partial \tau}_{|\tau \leq \bar{\tau}_s} > 0$: As far as condition 4.8 is satisfied, the share of observable output that a bank will extract to a firm s is increasing in τ.

iv) $\frac{\partial \widetilde{a}_s^*}{\partial \tau}_{|\tau \leq \bar{\tau}_s} < 0$: As far as condition 4.8 is satisfied, the effort made by a firm s for a contract that specifies that the financial term of the loan is $\widetilde{R}_s^*$ is decreasing in τ.

Proof of lemma 5: see Appendix 4.A.

Lemmas 4 and 5 bring important implications that might be tested empirically. The aim of this chapter is to explain how the lack of liquidity might be the result of high taxation. Thus, we are mainly interested in the following implication.

Testable Implication 4 *Parts i) of lemmas 4 and 5 imply that the higher the tax rate, the higher the probability that a firm j, $\forall j = \{h, s\}$, does not obtain a loan.*

4.2.2.3 A comparison between firms h and s

In this subsection, we compare the situation of firms h and firms s on the loan market. We especially look at when firms s obtain a loan and firms h do not and vice versa.

Conditions 4.6 and 4.8 imply that firms s obtain loans and firms h do not if $\tau \in (\bar{\tau}_h, \bar{\tau}_s]$, which is possible if and only if:

$$\bar{\tau}_s > \bar{\tau}_h \tag{4.9}$$

As we said in lemmas 4 and 5, $\bar{\tau}_h$ depends on A_g, B_g and S_m, while $\bar{\tau}_s$ depends on these exogenous parameters, as well as two others: B_b and A_b. Remember that $B_b \in (0, B_g]$ is the private benefit of a manager s who launches a poor project

(because his bad project is subsidized). $A_b \in (0,1)$ is the output of a subsidized bad project that goes toward debt repayment to the initial loan of the bank. Thus, the difference of situation between firms h and firms s on the loan market is characterized by these two parameters. Thus, *the specificity of firms s on the loan market* is denoted (B_b, A_b). And we have:

Lemma 6 *i) The equation*

$$Z(B_b, A_b) = \bar{\tau}_s(B_b, A_b) - \bar{\tau}_h = 0 \tag{4.10}$$

describes an upward sloping curve crossing the origin in the (B_b, A_b) *plane. If the specificity of the firms s on the loan market belongs to the set of points* (B_b, A_b) *that lie above the graph of this curve,* $\bar{\tau}_s > \bar{\tau}_h$*. If it belongs to the set of points* (B_b, A_b) *that lie below the graph of this curve,* $\bar{\tau}_h > \bar{\tau}_s$*.*
ii) If the specificity of the firms s on the loan market belongs to the set of points (B_b, A_b) *that lie above the graph of this curve, then condition 4.6 is more demanding than condition 4.8, in which case being a firm s serves to obtain a loan.*

Proof of lemma 6: see Appendix 4.A.

Part i) of lemma 6 says that if A_b, the output of a subsidized bad project, is sufficiently high, and if at the same time B_b, the private benefit of a manager s who has launched a bad project, is sufficiently low, then $\bar{\tau}_s > \bar{\tau}_h$. *Ceteris paribus*, when A_b is high, $\widehat{a}_s$, the minimum level of effort that a firm s has to make to obtain a loan, is low. The reason is that a bank expects the government will be the guarantor of this firm s if it is in trouble. Thus, *ceteris paribus*, the higher A_b, the higher the threshold $\bar{\tau}_s$. Concerning B_b, the private benefit of a firm s when it has launched a bad project, the lower it is is, the higher the effort of a firm s. Indeed, the lower B_b, the higher a_s^*, the effort made by a firm s. In other words, if the budget constraint is soft but obtaining a bad project gives a small private benefit, the manager will strive harder. So *ceteris paribus*, the lower B_b, the higher the threshold $\bar{\tau}_s$. So if A_b is sufficiently high and B_b sufficiently low, condition 4.9 is satisfied. Figure 4.4 is a

graphical representation of this lemma. We consider the same values as in figures 4.1, 4.2 and 4.3 for $A_g = 4.25$, $B_g = 0.5$ and $S_m = 1$; and $\bar{\tau}_h \simeq 0.414$, as we find in panel (b) of figure 4.3. The upward sloping curve given by $Z(B_b, A_b) = 0$ divides the (B_b, A_b) plane. Now if we consider that $A_b = 0.9$ and $B_b = 0.5$ like in the previous figures, we find that the point $(0.5, 0.9)$ falls in the set of points that lie above the graph of the curve. This is not surprising given that by computation we obtain $\bar{\tau}_s = 0.922$. Thus, if $\tau \in (0.414, 0.922]$, the firms s obtain loans and the firms h do not as shown by figure 4.5.

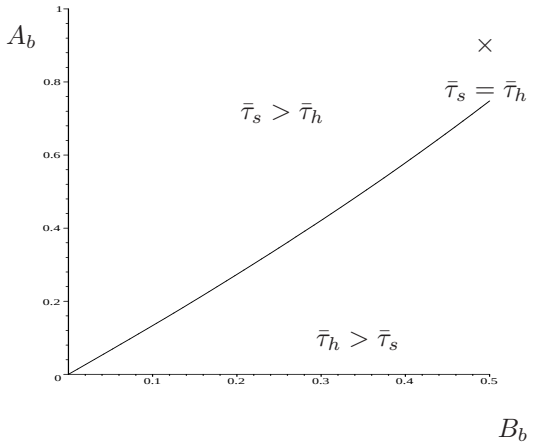

Figure 4.4: When $\bar{\tau}_s > \bar{\tau}_h$?
Parameter values of the upward sloping curve:
$A_g = 4.25$;$B_g = 0.5$; $S_m = 1$, $\bar{\tau}_h \simeq 0.414$
Coordinates (B_b, A_b) of $\times$: $(0.5, 0.9)$.

Part ii) of lemma 6 says that when $\bar{\tau}_s > \bar{\tau}_h$, the condition for a firm s to obtain a loan ($\tau < \bar{\tau}_s$) is less demanding than the one for a firm h ($\tau < \bar{\tau}_h$). It is the interesting case because it might explain why firms h are more confronted to a lack of liquidity and that banks tend to give preference to firms s, especially in the FSU. Our hypothesis is that we are in this situation. So our second testable implication is the following one.

Testable Implication 5 *We expect that a firm s has a higher probability of obtaining a loan.*

There are two other interesting points in the comparison of firms h and s when both of them obtain loans (i.e. when $\tau < \bar{\tau}_j$, $\forall j = \{h, s\}$). The first one is that we

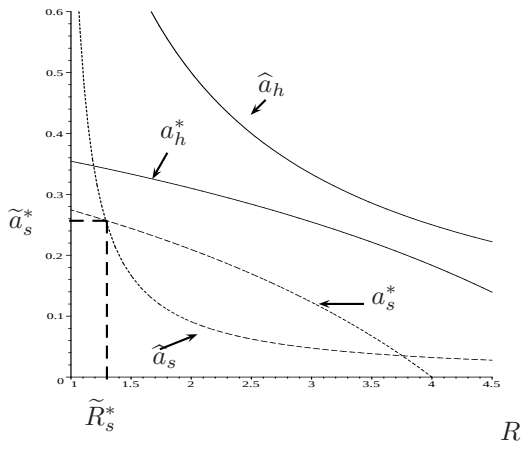

Figure 4.5: Which firms have a loan if $\bar{\tau}_h < \tau \leq \bar{\tau}_s$? An example.
Parameter values of the best response function a_h^* and/or $\widehat{a}_h$ (both in solid): $A_g = 4.25; B_g = 0.5; \tau = 0.7$; $S_m = 1$
Parameter values a_s^* and/or $\widehat{a}_s$ (both in dot): $A_g = 4.25; B_g = B_b = 0.5; \tau = 0.7$; $S_m = 1$; $A_b = 0.9$

might be in a situation such that $\widetilde{R}_h^* > \widetilde{R}_s^*$. In other words, the value of R specified in the contract might be higher for a firm h than for a firm s. It occurs when A_b is sufficiently high and B_b sufficiently low. First, A_b is like an insurance for a bank; so the higher A_b, the lower $\widehat{a}_s$, the minimum level of effort that a firm s has to do to obtain a loan. Consequently, $\widetilde{R}_s^*$ will be lower. Second, the lower B_b, the higher the effort of a firm s so the lower $\widetilde{R}_s^*$. So like for the thresholds $\bar{\tau}_h$ and $\bar{\tau}_s$ in figure 4.4, it is possible to show that there is an upward sloping curve in the (B_b, A_b) plane such that if the specificity of the firms s belongs to the set of points that lie above the graph of this curve, then $\widetilde{R}_h^* > \widetilde{R}_s^*$.[9] In Table 4.3, we compute $\widetilde{R}_h^*$ and $\widetilde{R}_s^*$ for various level of tax rates, assuming like in the preceding numerical computations that $A_g = 4.25$, $B_g = B_b = 0.5$, $S_m = 1$ and $A_b = 0.9$. One might see that in this case, when $\tau < \bar{\tau}_j$, $\forall j = \{h, s\}$, $\widetilde{R}_h^* > \widetilde{R}_s^*$.

The second interesting point is that we might be in a situation such that $\widetilde{a}_h^* < \widetilde{a}_s^*$. This result might seems paradoxical given that lemma 1 tells us that *ceteris paribus*, a_h^*, the best response function of a firm h, is always higher than a_s^*; and the higher

[9] However, remark that in this case, the upward sloping curve depends on the tax rate because $\widetilde{R}_h^*$ and $\widetilde{R}_s^*$ depends on it.

Table 4.3: Numerical computation of the model

Tax rate	**Firm** h		**Firm** s	
τ	$\widetilde{R}_h*$	$\widetilde{a}_h^*$	$\widetilde{R}_s^*$	$\widetilde{a}_s^*$
0.000	2.098	0.477	1.096	0.509
0.050	2.150	0.465	1.100	0.500
0.100	2.210	0.453	1.104	0.489
0.150	2.279	0.439	1.109	0.478
0.200	2.359	0.424	1.115	0.466
0.250	2.456	0.407	1.121	0.453
0.300	2.576	0.388	1.127	0.440
0.350	2.735	0.366	1.135	0.425
0.400	3.000	0.333	1.144	0.409
$\bar{\tau}_h \simeq 0.414$	3.224	0.310	1.147	0.404
0.450			1.155	0.392
0.500			1.168	0.373
0.550			1.184	0.352
0.600			1.204	0.329
0.650			1.230	0.303
0.700			1.265	0.274
0.750			1.316	0.240
0.800			1.395	0.202
0.850			1.537	0.157
0.900			1.898	0.100
$\bar{\tau}_s = 0.922$			2.648	0.057
0.950				
1.000				

Parameter values: $A_g = 4.25$; $A_b = 0.9$; $B_g = B_b = 0.5$; $S_m = 1$.

B_b, the higher the difference (see equation 4.A1 in Appendix A). However, there is a second reason that explains why a firm makes more or less effort. Because of lemma 2, if a firm s has to concede a smaller part of its marginal return of its effort than a firm h, *ceteris paribus* the firm s will make higher effort. So if $\widetilde{R}_h^* > \widetilde{R}_s^*$, we might be in a situation such that $\widetilde{a}_s^* > \widetilde{a}_h^*$. As shown by Table 4.3, in our numerical example it is always the case.

4.2.3 Which firms have soft budgets?

The model presented above does not consider why a firm will be subsidized in case of trouble. In other words why a firm has a SBC or a HBC. It is useful for our empirical section to resume what SBC theories say. SBC theories explaining that a government will rescue a firm (in our case through subsidies) to complete a project in order to repay the initial loan of a bank are of two kinds: i) politicians may value those firms for their political support or ii) the government may maximize the overall

social welfare. Kornai *et al.* (2003, p.1110) model these two reasons in the same way. They consider a parameter E_b which might be the per unit political benefit of keeping project workers employed, or alternatively the per unit external damage that the elimination of a bad project may generate on the rest of the economy. The per unit return of subsidizing the bad project of a firm for the government is $E_b - 1$. We assume for simplicity that the liquidation value is 0. It follows from the discussion that if $E_b \geq 1$, the government will prefer to subsidize a bad project of the firm. The output of the project $A_b(< 1)$ will go toward debt repayment to the initial loan of the bank. Thus, if $E_b \geq 1$, a firm has a SBC. It is subsidized by the government in case of trouble. If $E_b < 1$, a firm has a HBC and it will not be subsidized by the government in case of trouble.

A part of our empirical work will be to determine which firms are more likely to receive subsidies in case of trouble, so for which firms $E_b \geq 1$ and for which firms $E_b < 1$. Below, we present briefly two existing theories (a) and b)) explaining that the SBC is the result of political objectives, i.e. winning elections, and two reasons (c) and d)) explaining that the SBC is the result of global welfare argument.

a) Boycko *et al.* (1996) and Shleifer and Vishny (1994) especially show that the political objective of maintaining a higher-than-efficient level of employment to enlarge a political constituency is fostered by state ownership when the political cost of subsidizing employment through direct transfers is higher than the cost of forgoing the state's share of enterprise profits.[10] Another implication of their models is that soft budgets are more likely to arise when the objectives of owners are similar to those of the government. Thus, insider ownership is more likely to lead to soft budgets than is outsider ownership.

b) Second, the fact that firms might exert influence on the state through lobbying activities have paid little attention in recent SBC literatures contrary to older articles, like Goldfeld and Quandt (1988, p.506). They argue softness might be related to the lobbying activity of managers who are particularly "*well suited to whining*

[10] See also Robinson and Torvik (2006) who propose a model where self-interested politicians use government subsidies to enlarge their political constituency.

in the corridors of government departments". It is also a political motive because lobbyists can influence politicians threatening to provide voters with damaging information about them or their policies.

c) The state might bail out a troubled firm if its demise might cause external damage greater than the cost of rescue as Kornai (1998) and Segal (1998) argue. A benevolent government may choose to bail out an unprofitable monopoly, because the elimination of its production may upset other firms as well, and precipitate a serious loss to society. In the model of Segal (1998), anticipating a bail out, the firm may deliberately make its product costly and unwanted by consumers. This would make the firm's threat of shutdown credible. Using this threat, the firm extracts a part of the social surplus in the form of subsidies.

d) Finally, Kornai (1998) highlights that governments may make SBC-type interventions to save jobs and reduce the insecurity of employees. Consequently, firms that are too big to fail are more likely to be subsidized. Furthermore, we might expect that the higher the percentage of firms' employees that are unskilled workers, the higher the probability of obtaining subsidies because unskilled workers are more confronted to insecurity than skilled workers (it is more difficult for them to find another employment when their firms are closed).

The following testable implication resumes the discussion.

Testable Implication 6 *a) The Shleifer-Vishny argument: If a firm is a SOE or a MEBO, it has a higher probability of being of type s.*

b) The Goldfeld-Quandt argument: A firm which is member of a lobby is more likely to be a firm of type s.

c) The Kornai-Segal argument: A monopoly has a higher probability of being of type s.

d) The too big to fail and insecurity arguments: A Large enterprise has a higher probability of being of type s; the higher the percentage of the firm's employees that are unskilled workers, the higher the probability that this firm is of type s.

4.3 Econometric methodology

This section presents our econometric methodology and the data at our disposal.

4.3.1 Statistical model

Given the model sketched above and the data at our disposal (that we will describe in the next subsection), we propose an econometric model that especially tests implications 4 and 5. Testable implication 4 tells us that the tax rate has a negative impact on the probability of obtaining a loan. Testable implication 5 tells us that a firm s has a higher probability of obtaining a loan than a firm h. Although we studied only two types of firms (s and h) for the sake of analytical simplicity, the types of firms, in reality, form a continuum with the firms s at one extreme (those that have a probability of 100% to be subsidized in case of trouble) and the firms h at the other extreme (those that have a probability of 0% to be subsidized in case of trouble). Thus, we first model which firms are more likely to be subsidized in case of trouble (testable implication 6). It permits to obtain a predicted probability of obtaining subsidies in case of trouble for each firm. Then, this variable and the tax rate are explanatory variables in a loan selection model. Below, we present in detail our econometric strategy.

Which firms a government will subsidize in case of trouble? For each firm i operating in country k, the government of this country has to choose if it will subsidize this firm in case of trouble. Let $U_{Subs_{i,k}} \equiv E_b - 1$ be the government k's per unit return of subsidizing the firm i if it obtains a bad project, and $U_{\neg Subs_{i,k}} = 0$ the government's per unit return of not subsidizing the firm i in country k if it obtains a bad project normalized to 0. Hence, the subsidies indicator $Subs$ equals 1 if $U_{Subs_{i,k}} \geq U_{\neg Subs_{i,k}}$ and 0 if $U_{Subs_{i,k}} < U_{\neg Subs_{i,k}}$. Following Greene (2003, p.670), a common formulation for this kind of model in econometrics is the linear random

utility model,

$$U_{Subs_{i,k}} = Z_{i,k}\theta_1 + \epsilon_{1,i,k} \text{ and } U_{\neg Subs_{i,k}} = Z_{i,k}\theta_2 + \epsilon_{2,i,k} \tag{4.11}$$

where $Z_{i,k}$ is the vector of characteristics: the dominant owner, the size, the number of competitors or if the firm is member of a lobby as we said in the testable implication 6. $\epsilon_{1,i,k}$ and $\epsilon_{2,i,k}$ are random component of utility. Then, if we denote by $Subs_{i,k} = 1$ the government k's choice of subsidizing the firm i, we have:

$$\begin{aligned}
\text{Prob}[Subs_{i,k} = 1|Z_{i,k}] &= \text{Prob}[U_{Subs_{i,k}} > U_{\neg Subs_{i,k}}] \\
&= \text{Prob}[Z_{i,k}\theta_1 + \epsilon_{1,i,k} - Z_{i,k}\theta_2 - \epsilon_{2,i,k} > 0|Z_{i,k}] \\
&= \text{Prob}[Z_{i,k}(\theta_1 - \theta_2) + (\epsilon_{1,i,k} - \epsilon_{2,i,k}) > 0|Z_{i,k}] \\
&= \text{Prob}[Z_{i,k}\theta + \epsilon_{i,k} > 0|Z_{i,k}] = \Phi(Z_{i,k}\theta)
\end{aligned} \tag{4.12}$$

An obvious choice for error distribution is that $\epsilon_{1,i,k}$ and $\epsilon_{2,i,k}$ are normal. Then $\epsilon_{i,k} = (\epsilon_{1,i,k} - \epsilon_{2,i,k})$ is normally distributed. Normalization of the variance of $(\epsilon_{1,i,k} - \epsilon_{2,i,k})$ to unity gives the probit since then Φ in equation 4.12 is the standard normal cumulative distribution function.

For each firm i which applies for a loan, the bank chooses if it grants a loan to this firm or not. Let $V_{Loan_{i,k}}$ be the bank's per unit return of granting a loan to the firm i, and $V_{\neg Loan_{i,k}}$ the bank's per unit return when it refuses the loan to the firm i and invests in an alternative opportunity. Hence, *Loan* equals 1 if $V_{Loan_{i,k}} \geq V_{\neg Loan_{i,k}}$ and 0 if $V_{Loan_{i,k}} < V_{\neg Loan_{i,k}}$. Considering like for the government a linear random utility model, the probability that the firm i obtains a loan is:

$$\begin{aligned}
\text{Prob}\left[Loan_{i,k} = 1|\Phi(Z_{i,k}\theta), X_{i,k}, \tau_k, Y_k\right] &= \text{Prob}[V_{Loan_{i,k}} > V_{\neg Loan_{i,k}}] \\
&= \Phi(\Phi(Z_{i,k}\theta)\gamma + X_{i,k}\zeta + \tau_k\alpha + Y_k\delta + \eta_{i,k} > 0)
\end{aligned} \tag{4.13}$$

where $\eta_{i,k}$ is the perturbation term. $\Phi(Z_{i,k}\theta)$ is the firm's probability of obtaining

subsidies in case of trouble. We expect that this variable will be statistically significant and positive as the testable implication 5 suggests. The vector $X_{i,k}$ includes other characteristics of the firm i, which are control variables at the firm-level. τ_k is the tax rate that a typical firm has to pay in the country k. We expect that this variable will be statistically significant and negative as it is suggested by the testable implication 4. The vector Y_k includes other macroeconomic variables, to be sure that the negative impact of the tax rate on the probability of obtaining a loan does not capture other contextual macro effects often mentioned in the literature. For example, Hoff and Stiglitz (2004) highlight that the rule of law is a serious problem in transition economies. And one might reasonably argue that if the legal and regulatory institutions supporting ownership and market transactions are not in place, the bank will not be able to pressure firms to take its collateral in case of trouble so it will have less incentives to grant a loan to the firm.

Thus we have an overall model in which the *Subs* probit (equation 4.12) is embedded in the *Loan* probit (equation 4.13). Remark that the probability, rather than the actual value of the variable *Subs*, is chosen deliberately in the *Loan* probit. Indeed, we view the difference as that between an *ex ante* and an *ex post* variable, respectively, as Greene (2003, p.511) highlights.

To estimate this model, we adopt a limited information maximum likelihood two-step procedure. In a first step, we estimate the parameters of the *Subs* probit (equation 4.12) since it does not involve the parameter vector of the *Loan* probit (equation 4.13). These parameters permit to obtain, $\Phi(Z\widehat{\theta})$, a predicted probability for Prob[*Subs*] for each firm. In a second step, we estimate the parameters of the *Loan* equation 4.13 by maximum likelihood, with $\Phi(Z\widehat{\theta})$ inserted instead of $\Phi(Z\theta)$, as if θ were known. As it is well known, such a procedure produces consistent parameters of the loan equation.[11] However, the estimated covariance matrix of

[11] As highlighted by Greene (2003, p.509), the argument for consistency of the estimators of the *Loan* equation 4.13 $(\widehat{\gamma}, \widehat{\zeta}, \widehat{\alpha}, \widehat{\delta})$ is that if the vector of the *Subs* equation θ were known, then all our results for maximum likelihood estimation would apply for estimation of the parameters of the *Loan* equation $(\gamma, \zeta, \alpha, \delta)$. Since plim $\widehat{\theta} = \theta$, this line of reasoning is correct (asymptotically).

the estimators of the *Loan* equation needs to be adjusted to take into account the variability in $\widehat{\theta}$, the estimator of the *Subs* probit.

To obtain valid variance estimator for the parameter of the loan equation $(\widehat{\gamma}, \widehat{\zeta}, \widehat{\alpha}, \widehat{\delta})$, we use the Murphy-Topel variance estimate. This is one of the results of Murphy and Topel (1985) who propose a general formula of an appropriate valid variance estimator for the parameter of the second-step equation in a two-stage maximum likelihood estimation model.[12]

4.3.2 The data

The micro data used in this chapter are drawn from BEEPS III, developed jointly by the World Bank and the EBRD. It is a survey of 9655 firms in 26 transition economies[13], as well as in Turkey, conducted in the first half of 2005. It was collected on the basis of face-to-face interviews with owners, managers or finance officers through site visits by surveyors trained according to a standardized methodology. The sample was structured to be representative of each countries with specific quotas placed on size, sector, ownership and export orientation (Synovate, 2005). We have restricted our sample to firms in transition economies, i.e. we drop firms located in Turkey (557 observations).

The BEEPS III data set includes some interesting questions for our empirical work. Table 4.4 provides the descriptive statistics of the main variables of interest. It especially provides the three following crucial information:

- If the firm recently obtained a loan from a bank or not (the *Loan* variable).

[12] Greene (2003, pp.509-510) gives a concise presentation of the Murphy-Topel variance estimate. In this chapter, all estimations were done using Stata. To our knowledge, there is no Stata ado programs providing Murphy-Topel standard error estimates. To understand how to compute Murphy-Topel variance estimates in Stata, one might read Hardin (2002) and Hole (2006). Hole (2006) is particularly interesting because it compares the Stata code between various econometric models in the first step and in the second step. For example, it explains the difference in the Stata code if the equation in the first step is estimated via a logit instead of a probit.

[13] Albania, Armenia, Azerbaijan, Belarus, Bosnia, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Poland, Romania, Russia, Slovakia, Slovenia, Tajikistan, Ukraine, Uzbekistan and Yugoslavia. Like in previous BEEPS reports, it was not possible to conduct the survey in Turkmenistan in 2005 (Synovate, 2005, p.6).

- If the firm needs a loan or not.

- If the firm has obtained a help from the national, regional or local government or other sources (especially the European Union) via subsidies for the last 36 months (the *Subs* variable).

Concerning the *Loan* variable, the framework developed in section 4.2 tells us that we have to consider firms which want a loan. We know from the survey if i) the firm obtained a loan recently and ii) if the firm did not apply for a loan because the firm does not need a loan. Consequently, we drop from the survey all the firms which say that they did not apply for a loan because they do not need it (2801 firms, Turkish firms excluded). Consequently, our sample is composed of 6297 firms.[14]. This sample of 6297 firms is called the original sample in Table 4.4 where descriptive statistics are presented. However, some of these 6297 firms do not answer some questions that serve as explanatory variables. At the end the used sample is composed of 5502 firms.[15] (So the loss of observations caused by missing answers is around 12% of the original sample.) But we believe that this does not bias our results because the summary statistics of the original and the used samples look very similar (Table 4.4).

Concerning the *Subs* variable, we consider that $Subs = 1$ if the firm has received subsidies from one of the following organizations: the national government, the regional/local government or the European Union (see Table 4.5).

Following the framework of section 4.2, and especially the testable implication 6, there are at least four sets of regressors of the *Subs* probit in which we are mainly interested. The variables of special interest are the following:

- For the Shleifer and Vishny (1994) argument, we consider a set of dummy variables that depicts the type of the firm's main shareholder. We especially

[14] The BEEPS data set is composed of 9655 firms. We dropped first 557 Turkish firms. We also dropped 2801 firms which did not apply for a loan because they do not need it.

[15] Remark that all the firms of Tajikistan are excluded because of missing answers and because none of the firms of Tajikistan has obtained subsidies. Consequently, when we estimate equation 4.12 with country dummies to control for specific country effects, the dummy for Tajikistan predicts failure perfectly.

Table 4.4: Descriptive statistics of the main variables of the sample

	Original sample					Used sample				
	Obs.	**Mean**	**Std. Dev.**	**Min**	**Max**	**Obs.**	**Mean**	**Std. Dev.**	**Min**	**Max**
Loan	6297	0.614	0.487	0	1	5502	0.630	0.483	0	1
Subs	6297	0.085	0.279	0	1	5502	0.090	0.287	0	1
Largest shareholder										
Individual	6297	0.639	0.480	0	1	5502	0.633	0.482	0	1
Family	6297	0.088	0.283	0	1	5502	0.088	0.283	0	1
Domestic company	6297	0.055	0.228	0	1	5502	0.057	0.233	0	1
Foreign company	6297	0.052	0.223	0	1	5502	0.051	0.220	0	1
Managers	6297	0.024	0.155	0	1	5502	0.025	0.158	0	1
Employees	6297	0.025	0.155	0	1	5502	0.027	0.162	0	1
State	6297	0.075	0.264	0	1	5502	0.078	0.268	0	1
Others	6297	0.039	0.195	0	1	5502	0.039	0.195	0	1
Firm's size										
Employees<50	6296	0.688	0.463	0	1	5502	0.680	0.466	0	1
50≤Employees<250	6296	0.210	0.407	0	1	5502	0.213	0.409	0	1
Employees≥250	6296	0.102	0.303	0	1	5502	0.106	0.308	0	1
$\frac{\text{Unskilled workers}}{\text{Total employees}}$	6229	11.00	18.54	0	100	5502	11.49	18.79	0	100
Market power										
Monopoly	6192	0.151	0.358	0	1	5502	0.146	0.353	0	1
1-3 competitors	6192	0.214	0.410	0	1	5502	0.214	0.410	0	1
4 or more	6192	0.634	0.481	0	1	5502	0.639	0.480	0	1
Lobby	6297	0.403	0.490	0	1	5502	0.411	0.492	0	1
External audit	6165	0.463	0.499	0	1	5502	0.471	0.499	0	1
Training	5815	0.439	0.496	0	1	5502	0.440	.496	0	1
Account	6297	0.827	0.377	0	1	5502	0.835	0.370	0	1
Predicted value of the probability to be subsidized										
$\Phi(Z\widehat{\theta})$	5996	0.088	0.110	0.0005	0.804	5502	0.090	0.113	0.0006	0.811

Table 4.5: Enterprise officials were asked if over the last 36 months their firm has received any subsidies from the national government, regional/local government or another sources (included European Union)

	Total sample				Used sample			
	Yes(=1)	**No**(=0)	**Total**	**% of Yes**	**Yes**(=1)	**No**(=0)	**Total**	**% of Yes**
[1] National government	301	5946	6247	4.82	277	5192	5469	5.06
[2] Regional/local government	129	6105	6234	2.07	116	5342	5458	2.10
[3] Other sources	183	6114	6297	2.91	178	5322	5500	2.90
Subs	540	5761	6297	8.57	499	5003	5502	9.00

Notes: i. $Subs = 1$ iff $([1] = 1) \cup ([2] = 1) \cup ([3] = 1)$

expect that state firms, as well as firms owned by managers and employees,

are more likely to obtain subsidies.[16]

- In BEEPS III firms are asked whether or not they are a member of a business association and if lobbying government is an important service of this association. As Campos and Giovannoni (2007) do, we consider the variable *Lobby*, with $Lobby = 1$ if the firm is a member of a business association and answers that lobbying government is an important service of the association, 0 otherwise. It permits to test the Goldfeld and Quandt (1988) argument that the obtention of subsidies in case of trouble is related to the lobbying activity of managers.[17]

- Third, a set of dummy variables standing for the firm's market power is introduced to test the Kornai-Segal argument that monopolies are more likely to obtain subsidies.

- Fourth, we also consider a set of dummy variables that describe the firm's size (number of full-time workers) to test the too big to fail argument. We expect that the bigger (smaller) the firm, the higher (lower) the probability of obtaining subsidies. Furthermore, we also consider the percentage of the firm's employees that are unskilled workers.

We will also control for the sector of activity. As highlighted by Kornai (1992, p.143), some priority sectors might be more likely to obtain subsidies. To control for sectoral effects, we use the eight-sector categorization proposed by BEEPS III.[18]

[16] Table 4.4 indicates that there are eight categories of main shareholders: "individual", "family", "domestic company", "foreign companies", "managers", "employees", "state" and "others". In fact, the BEEPS III survey also proposes three additional categories: "bank", "investment fund" and "general public". The number of firms in these three categories in the BEEPS III survey of 9655 firms is very low: 86 firms have answered "general public", 7 "banks" and 40 "investment funds". When we only consider the loan applicants, i.e. our original (used) survey, the numbers are 58 (50), 4 (4) and 35 (35), respectively. Whatever the sample of the survey, the number of firms in these categories is too low to obtain consistent and convergent estimators, and consequently, we included these firms in the category "others".

[17] As Goldfeld and Quandt (1988) suggest, it is also possible that firms lobby directly as opposed to lobbying indirectly through a trade association or lobby group. Unfortunately, BEEPS III does not contain information on this.

[18] The eight sectors are: i) mining and quarrying, ii) construction, iii) manufacturing, iv) transport storage, v) Wholesale, retail, repairs, vi) Real estate, renting and business services, vii) Hotels and restaurants and viii) other.

However, remark that the enterprises surveyed in BEEPS III are engaged in activities that take place normally in competitive markets: Synovate (2005, p.4) highlights that firms which operate in sectors subject to government regulation and supervision, such as banking, electric power, rail transport, and water and waste water, were to be excluded from the sample of BEEPS III.

The right-hand side variables of the *Loan* equation are variables reflecting the characteristics of the firm: the main shareholder, the size, the number of competitors, the sector of activity, and the percentage of sales by customers (government or government agencies, state-owned enterprises, large private domestic company and small firms and individuals). We also include three dummy variables that can be perceived by the banks as a signal of a firm trying to adapt to the rules of a market economy. Consequently, a bank is more disposed to grant a loan to such a firm. The first dummy variable equals 1 if the firm lets its annual financial statement reviewed by an external auditor, 0 otherwise (External audit). The second dummy variable equals 1 if some employees received training over the last 12 months (Training). The third dummy variable equals 1 if the firm has a checking account, 0 otherwise. Last but not least, we include $\Phi(Z\widehat{\theta})$, the predicted probability of obtaining subsidies.

For macroeconomic variables in the *Loan* equation, the data are from the 2005 EBRD Transition Report, the world development indicator (World Bank, 2006b) and from Doing Business 2007 a database recently constructed by the World Bank (2006a). Doing Business provides objective measures of business regulations and their enforcement, and especially quantitative indicators on the tax rate, payment frequency and time to comply with taxes compared across transitional and other economies. We measure the tax rate τ as the total tax rate (% of profit) that a representative medium-size firm should pay.[19]This variable permits to test testable implication 4, and is introduced as an explanatory variable in the *Loan* probit.

[19] To create this variable, Doing Business proceeds as follow. It records the tax that a medium-size company must pay or withhold in a given year, as well as measures of the administrative burden in paying taxes. Taxes include the corporate income tax, social security contributions paid by the employer, property taxes, property transfer taxes, the dividend tax, the capital gains tax, the financial transactions tax, waste collection taxes and vehicle and road taxes.

In our model taxes are implicitly assumed to be used to subsidize firms of the SBC sector. Clearly, it seems that high tax rate in Belarus or Russia are used to finance important subsidies compared to other transition economies (see Table 4.2). But Doing Business reports that the tax rate paid by a representative firms in Hungary for the year 2005 is 60%, so 1.57 times more important than the tax rate in Poland (38.4%). And subsidies in per cent of GDP are very similar (see Table 4.2). Thus, one might argue that tax revenues finance investments in public infrastructures such as transportation networks and/or a legal system that protects property rights. And it is reasonable to expect that some firms derive substantially more benefit from these public investments. Consequently, we will also propose some regressions with subsidies in per cent of GDP as an additional explanatory variable. If the story of our model is empirically consistent, $\left(\frac{\text{Subsidies}}{\text{GDP}}\right)$ will capture a part of the tax rate effect. However, whatever the transition economy, this variable is unavailable for the year 2005 in the 2005 EBRD Transition Report. For each country we use the ultimate year provided by the EBRD. It is the value of 2004 for Armenia (0.8%), Azerbaijan (10.9), Belarus (18.3), Bulgaria (2.5), Czech Republic (9.3), Estonia (1.7), FYR Macedonia (8.7), Georgia (2.4), Hungary (3.8), Kyrgyz Republic (3.1), Latvia (5.1), Lithuania (0.4), Poland (3.6), Romania (14), Serbia and Montenegro (3.1), Slovak Republic (1.6), Slovenia (1.5), Tajikistan (0.7), Uzbekistan (2.2); the value of 2003 for Croatia (19.7), Kazakhstan (0.1) ; the value of 2002 for Ukraine (1.2); the value of 2001 for Bosnia and Herzegovia (0.4), the value of 1999 for Russia (5.3).

In order to ensure that the tax rate does not proxy for other contextual macro effects, we introduce various variables mentioned in the literature on transition. As suggested in the previous subsection, we include an indicator of the legal environment. We construct the indicator "Law" which includes two EBRD legal transition indicators: the EBRD rating of the legal extensiveness (Lex) and the EBRD rating of the legal effectiveness (Lef). Law is the average of the scores given for the two indicators $\left(\frac{Lex+Lef}{2}\right)$, as the EBRD does in some Transition Report (e.g., EBRD, 2001, pp.34-35). However, we do not include this indicator as such, because Lex and Lef,

which range from 1 to 4.33, are ordinal but not cardinal. In other words, a score of 4 for a country does not mean that it has made twice as much progress in the legal extensiveness or effectiveness than a country scoring 2. To overcome this problem, we transform the Law indicator into three dummy variables. The variable Law I takes the value 1 if Law is greater than 3, 0 otherwise. The variable Law II takes the value 1 if Law $\in (2, 3]$, 0 otherwise, and Law III takes the value 1 if Law $\in [1, 2]$, 0 otherwise. We also control for the inflation rate. Inflation, when unexpected, arbitrarily redistributes wealth among individuals. Loan agreements usually specify a nominal interest rate, which is based on the rate of inflation expected at the time of the agreement. If inflation turns out to be higher than expected, say in Belarus, the debtor wins and the creditor loses because the debtor repays the loan with less valuable Belarussian roubles. Standard macroeconomic textbooks often highlight that countries with high average inflation also tend to have inflation rates that change greatly from year to year. It increases uncertainty for the banks by subjecting them to arbitrary and potentially large lost of wealth. Consequently, one might expect it is more complicated to obtain loans in countries with high inflation rate. Furthermore, as a *proxy* for the level of development, we consider GDP_{pc}, the GDP per capita converted to constant 2000 international dollars using purchasing power parity rates provided by the World Bank (2006b).[20] We also control for variables reflecting the quality of the banking sector. We consider two variables provided by the EBRD (2005): the number of banks operating in the country and the percent of non performing loans $\left(\frac{\text{Bad loans}}{\text{Total loans}}\right)$. Lastly, we consider in some specifications dummy variables for the Western Former Soviet Union (WFSU[21]) (Belarus, Moldova, Russia and Ukraine), Central Asia (Kazakhstan, Kyrgyz Republic and Uzbekistan) and Caucasus (Armenia, Azerbaijan and Georgia). The justification for doing this is the following. Even if we control for the rule of law, inflation, the quality of the

[20] An international dollar has the same purchasing power over GDP as the US dollar has in the United States.

[21] The WFSU countries are FSU countries that share a border with the enlarged EU, i.e. Russia, Ukraine, Belarus and Moldova.

banking sector and the gdp per capita, it is possible that we have omitted important macroeconomic variables that are correlated with the tax rate. But it is impossible to control for all possible macroeconomic factors without identifying them and checking for each one. The problem of high tax rates seems to be a problem in some countries of the FSU and regional dummy variables will control for potential regional specific effects.

4.4 Estimation results

In a first subsection, we consider which firms are more likely to obtain subsidies, i.e. we regress various specifications of equation 4.12. These specifications permit to generate a predicted probability of being subsidized that is used in a second subsection as an explanatory variable of the *Loan* probit.

4.4.1 Which firms are more likely to obtain subsidies?

We first present the results of the *Subs* equation, i.e. we examine the effects of the variables that are suggested by the testable implication 6. Results appear in Table 4.6 which proposes various specifications, in which we always control for the sector of activity and country specific effects. For each specification, we propose the probit coefficients as well as the marginal effects (or discrete changes for dummy variables) at the mean values. Given that there is an extensive theoretical literature on why state ownership might be more able to obtain subsidies, we especially focus on the Shleifer-Vishny argument of testable implication 6. Specification [A] contains the probit when only the variables that depict the type of the firm's main shareholder is introduced. State ownership is highly significant. Being a state-owned firm raises the probability of being subsidized by 11.4 percentage points. One might see this result as a confirmation of the Shleifer-Vishny argument developed in subsection 4.2.3. This regression controls for possible sectorial effects, but the fact that state-owned enterprises are more likely to obtain subsidies might be due to the fact that

these state firms are monopolies. A government that cares about social welfare (and that do not care about winning elections) will intervene in response to this market failure. In the model of Segal (1998) for example, the manager of a state monopoly anticipates that the government is benevolent. Consequently, the manager may underinvest to become unprofitable, extract state subsidies and obtain a better payoff than in the case of an independent profitable production. Alternatively, one might argue that these state firms are too big to fail. If managers anticipate that the benevolent government will rescue them, they have lower incentives to work. However, when we control for these variables (that are also suggested by the testable implication 6), the firm being state-owned raises the probability of being subsidized by (at least) 9.44 percentage points (see specification [E] which contains a probit regression containing all variables). Remark that the "State" variable is the unique "Main shareholder" variable that is always positive and significant. Firms owned by managers and employees are not more likely to obtain subsidies.

The fact that subsidies are the result of political motives is confirmed when we consider the impact of being a lobby member. Like for the remaining variables suggested by the testable implication 6, the "Lobby" variable is tested in two versions of the probit. First, we run regressions that contain the main shareholder variables and this variable (specification [B] of Table 4.6). Then, we present a regression containing all variables (specification [E]). The two versions of the probit regressions are consistent in their implications. If a firm is a lobby member, the probability of being subsidized increases by between 3.6 (specification [B]) and 2.57 percentage points (specification [E]).

Table 4.6: Which firms are more likely to obtain subsidies? Probit regressions using *Subs* as the dependent variable

	[A]		[B]		[C]		[D]		[E]	
	Probit coefficient	Marginal effect	Probit coef.	Marginal effect	Probit coef.	Marginal effect	Probit coef.	Marginal effect	Probit coef.	Marginal effect
Main shareholder										
Individual	-0.350***	-0.042***	-0.300***	-0.035***	-0.320***	-0.037***	-0.193*	-0.021*	-0.157	-0.017
	(0.098)	(0.013)	(0.099)	(0.012)	(0.100)	(0.013)	(0.10)	(0.012)	(0.10)	(0.012)
Family	-0.232*	-0.022**	-0.193	-0.018*	-0.208	-0.020*	-0.0513	-0.00529	-0.035	-0.003
	(0.13)	(0.010)	(0.13)	(0.011)	(0.13)	(0.011)	(0.13)	(0.013)	(0.13)	(0.013)
Domestic firm	Base group		Base group		Base group		Base group		Base group	
Foreign firm	-0.142	-0.014	-0.167	-0.016	-0.153	-0.015	-0.161	-0.015	-0.185	-0.017
	(0.14)	(0.013)	(0.14)	(0.012)	(0.15)	(0.013)	(0.15)	(0.012)	(0.15)	(0.012)
Managers	-0.244	-0.022	-0.187	-0.017	-0.202	-0.019	-0.148	-0.014	-0.088	-0.008
	(0.19)	(0.014)	(0.19)	(0.015)	(0.19)	(0.015)	(0.19)	(0.016)	(0.19)	(0.017)
Employees	-0.021	-0.002	0.030	0.003	0.0358	0.00405	0.0163	0.00176	0.094	0.011
	(0.18)	(0.019)	(0.18)	(0.020)	(0.18)	(0.021)	(0.18)	(0.020)	(0.18)	(0.022)
State	0.670***	0.114***	0.683***	0.115***	0.637***	0.105***	0.618***	0.099***	0.608***	0.094***
	(0.12)	(0.028)	(0.12)	(0.028)	(0.12)	(0.027)	(0.12)	(0.027)	(0.12)	(0.026)
Others	0.0953	0.011	0.105	0.012	0.103	0.0122	0.136	0.0161	0.141	0.016
	(0.14)	(0.018)	(0.14)	(0.018)	(0.14)	(0.018)	(0.15)	(0.019)	(0.15)	(0.019)
Lobby			0.316***	0.036***					0.238***	0.026***
			(0.058)	(0.007)					(0.061)	(0.007)
Market power										
Monopoly					0.225***	0.028**			0.236***	0.028***
					(0.082)	(0.012)			(0.084)	(0.011)
1-3 competitors					Base group				Base group	
4 or more competitors					-0.083	-0.009			-0.042	-0.004
					(0.068)	(0.007)			(0.069)	(0.007)
Firm's size										
Employees<50							-0.451***	-0.055***	-0.396***	-0.046***
							(0.065)	(0.009)	(0.068)	(0.009)
50≤Employees<250										
Employees≥250							-0.033	-0.00346	-0.079	-0.008
							(0.084)	(0.008)	(0.085)	(0.008)
$\frac{\text{Unskilled workers}}{\text{Total employees}}$							0.0003	0.00003	0.00031	0.00003
							(0.001)	(0.000)	(0.001)	(0.0001)
Sectoral variables	Yes		Yes		Yes		Yes		Yes	
Country dummies	Yes		Yes		Yes		Yes		Yes	
Obs.	5502		5502		5502		5502		5502	
Pseudo R^2	0.181		0.189		0.186		0.197		0.206	

Notes: i. Marginal effects are computed at the means values.
ii. Huber-White standard errors are reported in parentheses.
iii. *, ** and *** represent 10, 5 and 1% significance, respectively.

If it seems clear that political motives is a part of the story, one cannot exclude welfare concerns as well. The firm being a monopoly raises the probability of being subsidized by 2.8 percentage points in specifications [C] and [E]. The probability of being subsidized is about 4.65-5.54 percentage points lower when firms have less than 50 employees. Consequently, it might support models *à la* Segal (1998): opportunistic managers anticipating that they will be subsidized abuse of a benevolent government that includes in its objective function the social concern about output and about employment. However, one might remark that soft budgets are more likely to arise when the objectives of firms' managers are similar to those of the government, as Shleifer and Vishny (1994) and Boycko *et al.* (1996) argue. Consequently, the fact that monopolies and big firms raise the probability of being subsidized does not imply that the government is benevolent and the firm opportunistic. Truly, we might have a manager of a firm that has a monopsony power over labor and who obtains a better payoff when he extracts subsidies. But at the same time, the government might want to maintain a higher-than-efficient level of employment to enlarge a political constituency. Thus, the fact that monopolies and big firms raise the probability of being subsidized does not permit to claim that governments are benevolent. Lastly, remark that the percentage of the firm's employees that are unskilled workers has not a significant impact on the probability to obtain subsidies.

These results are broadly in line with some empirical anecdotes that claim that subsidies are the result of political motives. Ericson (1999) notes that a growing number of regional governments in Russia have subsidized struggling enterprises in return for the appearance of doing something to maintain political support. Sometimes regional governments have taken formal ownership of these struggling enterprises (Ericson, 1999).[22] Similarly, Gimpelson and Treisman (2002, p.172) provide evidences that in Russia "*regional governments boost public employment by hiring partisans and clients and extract greater federal aid*". Thus, politicians responded

[22] For example, Belgorod has taken over its iron ore combine and Sverdlovsk has taken a slake in Alkar Aluminium (Ericson, 1999). Ericson (1999) also notes that various regional governments took control interest in their leading regional banks, to favor their political support.

"*with bailouts because they knew, too, that regional voters would, quite rationally, have punished them if they did not*"(Gimpelson and Treisman, 2002, p.178). Similar observations occur for example in Bulgaria: Frye (2002, pp.317-318) notes that politicians have continually "*used [their] time in office to redistribute economic resources to [their] own supporters rather than to promote growth*".

4.4.2 Tax rate, probability to obtain subsidies and lack of liquidity

Now, we study if firms that are more likely to obtain subsidies are more likely to obtain a loan, i.e. testable implication 5. Furthermore, we quantify the impact of the tax rate on the probability to obtain a loan, i.e. testable implication 4.

To generate our variable $\Phi(Z\widehat{\theta})$, i.e. the predicted probability to obtain subsidies in case of trouble for the firm i, we use the specification [E] in Table 4.6. Table 4.7 presents our set of estimates of the *Loan* equation. In all cases the presence of generated regressors is taken into account by using Murphy and Topel (1985)'s results to obtain appropriate covariance matrix. Column [A] contains the basic specification with variables reflecting firm's characteristics and macro variables that ensure that the tax rate does not proxy for other contextual effects, namely variables that reflect the rule of law and the inflation. Additional (macroeconomic) controls are included in the other columns, as indicated in the Table.

In the five specifications, the estimated coefficient of the probability of being subsidized in case of trouble is always positive and statistically significant at the 1% level. Concerning the tax rate, the estimator is always negative and statistically significant. These first results are broadly in line with our theoretical framework.

In Table 4.8, we present the marginal effects (or discrete changes for dummy variables) at the mean values of some important micro and macro variables for the probability of obtaining a loan. The marginal effects of column [A] in Table 4.8 correspond to the results of the *Loan* probit of specification [A] in Table 4.7

and so on. Numerically, the micro variable that has the strongest effect appears to be the probability of obtaining subsidies; the estimated marginal effect which comes from 0.348 (specification [B]) to 0.450 (specification [E]) is by far the largest. Note that this variable cannot change by a full unit because it is a probability. An increase in 10 percentage points on the probability of being subsidized raises the probability of obtaining a loan by between 3.4 and 4.5 percentage points. As such, it is perhaps difficult to realize the magnitude of this effect. To get better understanding of the economic magnitude, let's consider the two extreme cases, that is when $\Phi(Z\hat{\theta}) = 0.0006$ is at the minimum and when $\Phi(Z\hat{\theta}) = 0.811$ is at the maximum.[23] At the means, the predicted probability of obtaining a loan for a firm with $\Phi(Z\hat{\theta}) = 0.0006$ is 0.61 if we consider specification [E] in Table 4.7. For the same firm with $\Phi(Z\hat{\theta}) = 0.811$, the probability is 0.90. The difference between these two extreme cases is thus 29 percentage points.

The effect of the other variable of interest, the tax rate (which also cannot change by a full unit because it is a proportion), decreases the probability by between 1.20 (column [A]) and 3.7 (column [E]) percentage points per 10 percentage points change. Again, it is perhaps difficult to realize the magnitude of this effect as such. Let's consider three cases: a firm which operates in a country where the tax rate is 38.4% (as in Poland), another which operates in a country where the tax rate is 70% (like in Russia), and a third which operates in a country where the tax rate is 186.1% (like in Belarus). At the means, the predicted probability of obtaining a loan for a firm with Tax= 0.384 is 0.72 in specification [E]. For the same firm with Tax= 0.70 the predicted probability of obtaining a loan is 0.60. Lastly, if Tax= 1.86, the probability of obtaining a loan is 0.18. So the tax rate has important negative effect

[23] See the descriptive statistics in Table 4.4.

on the probability of obtaining a loan.[24]

Another interesting point is the negative sign on the State variable. State firms have between 26.1 percentage points and 28.4 percentage points lower probability than private domestic firms to obtain a loan (specifications [D] and [E], respectively). This is the direct effect of the State variable produced by its presence in the *Loan* equation, but there is a positive indirect effect, that balance this considerable negative direct effect. Indeed, the State variable enters the *Subs* equation (the first step of our two-step maximum likelihood) and, therefore, influences the probability that *Subs* equals one. Since $\Phi(Z\widehat{\theta})$, the predicted probability that $Subs = 1$ appears in the *Loan* equation, this effect is transmitted back to Prob[$Loan = 1$]. Thus, to obtain the total effect of being a state firm (which is a binary variable), we compute the conditional mean function with this variable set to one and then zero, and take the difference:

$$\text{Prob}[Loan = 1|State = 1, \Phi(Z\widehat{\theta} + 0.608)] - \text{Prob}[Loan = 1|State = 0, \Phi(Z\widehat{\theta})]$$

where 0.608 is the estimated coefficient of the binary variable State in the *Subs* probit model [E] of Table 4.6, and $\widehat{\theta}$ the estimated coefficient vector of all the other explanatory variables. With specification [E] of Table 4.6 for the first step, and specifications [A], [B], [C], [D] and [E] of Table 4.7, the total effect of being a state-owned firm on the probability is around -0.22 at the means.[25] Like for the state firms, there is also a direct effect of the firm's size variables produced by their presence in the *Loan* equation, and an indirect effect because these variables enter the *Subs*

[24] One might argue that these important differences are especially due to the fact that we use specification [E] of Table 4.7 to compute the predicted probabilities to obtain a loan. This specification is the one with the highest negative impact for the tax rate. If we use specification [A] (the one where the negative impact of the tax rate is the lowest), at the means, the predicted probability of obtaining a loan for a firm with Tax= 0.384 is 0.67. For the same firm with Tax= 0.70, it is 0.63. And if Tax= 1.86, it is 0.45. Truly, the differences are lower, but they are still important.

[25] For example, consider that specification [E] of Table 4.6 is the first step of our two-step maximum likelihood and specification [E] of Table 4.7 the second step. First, we compute the predicted probability of *Subs* with State = 1. We obtain $\Phi(\overline{Z}\widehat{\theta} + 0.608) \simeq 0.14$ at the means. If State = 0, the probability is $\Phi(\overline{Z}\widehat{\theta}) \simeq 0.046$. Second, we compute Prob[$Loan = 1|State = 1, \Phi(Z\widehat{\theta}+0.608) \simeq 0.14] \simeq 0.43$ and Prob[$Loan = 1|State = 0, \Phi(Z\widehat{\theta}) = 0.046] \simeq 0.65$. And $0.43 - 0.65 \simeq -0.22$.

equation. For small firms (those with less than 50 employees), the direct effect is -0.145 (compared to medium firms) in specification [E] of Table 4.8. But given that the probability of obtaining subsidies is lower for these firms, the negative total effect is higher (in absolute value). Proceeding as we did for the State variable, we obtain that if a firm has less than 50 employees, the probability of obtaining a loan decreases by 16.7 percentage points.

4.4.3 Additional results and robustness checks

In this subsection we ask whether our framework and our basic results are robust.

First, the framework of section 4.2 suggests that the tax rate is the result of important subsidies. Consequently, if our story is empirically relevant, the inclusion of subsidies in percent of GDP as an additional explanatory variable in specifications [A], [B], [C], [D] and [E] of Table 4.7 should capture a part of the tax rate effect. Columns [A]-[E] of Table 4.9 report results of specifications [A]-[E] of Table 4.7, respectively, with $\left(\frac{\text{Subsidies}}{\text{GDP}}\right)$ as an additional explanatory variable whatever the specification. In specifications [A] through [D], the probit estimator of the subsidies in percent of GDP is negative and significant. Similarly, the tax rate estimator is still negative and statistically significant. But it is reduced (in absolute value) compared to specifications [A]-[D] of Table 4.7 and is only significant at the 10% level in specifications [A]-[B]. The fact that the probit coefficient of the tax rate is always reduced in these specifications is not a surprise given that the tax rate is statistically correlated with the percent of subsidies, the coefficient of correlation (p-value) being 0.45 (0.000). However, note that in specification [E] (when regional dummies are included), the probit coefficient of the tax rate is not reduced compared to specification [E] in Table 4.7; and the estimator of $\left(\frac{\text{Subsidies}}{\text{GDP}}\right)$ is positive and no more significant. This result is due to the fact that subsidies in percent of GDP are especially high in Azerbaijan, Belarus, Russia and Ukraine. So it suggests that these important subsidies are captured by the regional dummies.

Then, we ask how sensitive are our results if we exclude one country or a group

of countries at a time. The results of these sensitivity tests for the specification of column [E] in Table 4.7 are shown in Table 4.10. We reproduce the basic results from this specification in line [1] of Table 4.10. When we exclude one country at a time, results are broadly similar to the results obtained with all the sample (those presented in line [1]): the tax rate has a negative and significant impact and the probability of subsidies a positive and significant impact on the probability of obtaining a loan. With the exception of Moldova and Georgia, the negative impact of the tax rate is always reduced when we exclude the firms of one country of the WFSU (Belarus, Russia or Ukraine) or of the Caucasus (Armenia or Azerbaijan). The highest reduction is when we exclude Belarus in line [2]. The exclusion of this country reduces the negative marginal effect from -0.370 to -0.246. In line with these results, we find that the exclusion of all the countries of the WFSU at a time considerably reduces the negative impact of the tax rate: excluding this group of countries reduces the negative marginal effect of the tax rate from -0.370 to -0.294 (line [27]). Not surprisingly, this result implies that firms in the WFSU are those that are the most confronted to a lack of liquidity because of important budgetary pressures and high taxation. Remark that when we exclude the firms of one country of Central Asia (Kazakhstan, Kyrgyzstan or Uzbekistan) or all the firms of Central Asia at a time, the negative impact of the tax rate increases. It suggests that high taxation is a less serious problem in Central Asia than in the WFSU. Concerning the probability of obtaining subsidies, it always has a positive and significant impact. However, remark that the exclusions of Azerbaijan and Kazakhstan in lines [17] and [18] decrease the marginal effect from 0.437 to 0.288 and from 0.437 to 0.326, respectively. So the probability of subsidies has a higher impact on the probability of obtaining a loan in these two countries than in other transition economies. When we exclude one group of countries at a time, the impact of the probability of subsidies considerably decreases when we exclude Caucasus (Armenia, Azerbaijan and Georgia) in line [29]. Last but not least, remark that when we exclude all the countries of the WFSU at a time in line [27], the marginal

effect increases from 0.437 to 0.554. So the probability of subsidies has a lower impact on the probability of obtaining a loan in the WFSU than in the other countries. This result seems counterintuitive but it is not. Remember that in our model, if the tax rate is too high, that is if $\tau > \bar{\tau}_s > \bar{\tau}_h$, even the firms that are subsidized in case of trouble do not obtain a loan. It is in these countries that the negative impact of the tax rate is the highest. So it is because total tax rates (in percent of profit) are so high in these countries that the probability of subsidies has a lower impact on the probability of obtaining a loan.

Table 4.7: Which firms are more likely to obtain a loan in 2005?

	[A] *Loan*	[B] *Loan*	[C] *Loan*	[D] *Loan*	[E] *Loan*
$\Phi(Z\hat{\theta})$	0.953***	0.939***	1.216***	0.879***	1.185***
	(0.267)	(0.267)	(0.276)	(0.324)	(0.335)
Main shareholder					
Individual	-0.0918	-0.0899	-0.0768	-0.083	-0.088
	(0.088)	(0.088)	(0.090)	(0.088)	(0.091)
Family	-0.0224	-0.0205	0.0127	0.103	-0.0042
	(0.104)	(0.105)	(0.106)	(0.105)	(0.107)
Domestic company	Base group	Base group	Base group	Base group	Base group
Foreign company	-0.0340	-0.0351	-0.00077	-0.009	-0.0054
	(0.124)	(0.125)	(0.126)	(0.124)	(0.127)
Managers	0.143	0.144	0.139	0.134	0.060
	(0.147)	(0.146)	(0.148)	(0.146)	(0.149)
Employees	-0.227	-0.223	-0.185	-0.179	-0.207
	(0.138)	(0.139)	(0.140)	(0.138)	(0.141)
State	-0.692***	-0.688***	-0.714***	-0.670***	-0.730***
	(0.114)	(0.115)	(0.117)	(0.116)	(0.121)
Others	-0.0192	-0.0135	-0.0407	-0.030	-0.047
	(0.129)	(0.129)	(0.131)	(0.129)	(0.133)
Market power					
Monopoly	-0.252***	-0.249***	-0.259***	-0.249***	-0.256***
	(0.065)	(0.066)	(0.066)	(0.066)	(0.066)
1-3 competitors	Base group	Base group	Base group	Base group	Base group
4 or more competitors	-0.123**	-0.123**	-0.110**	-0.115**	-0.098**
	(0.046)	(0.046)	(0.047)	(0.046)	(0.047)
Firm's size					
Employees<50	-0.424***	-0.427***	-0.415***	-0.440***	-0.408***
	(0.052)	(0.052)	(0.053)	(0.054)	(0.055)
50≤Employees<250	Base group	Base group	Base group	Base group	Base group
Employees≥250	0.416***	0.415***	0.430***	0.425***	0.433***
	(0.083)	(0.083)	(0.084)	(0.083)	(0.085)
External audit	0.238***	0.236***	0.207***	0.208***	0.217***
	(0.039)	(0.040)	(0.040)	(0.040)	(0.040)
Training	0.261***	0.262***	0.282***	0.276***	0.253***
	(0.038)	(0.039)	(0.039)	(0.039)	(0.039)
Account	0.135	0.142	0.120	0.102*	0.136**
	(0.054)	(0.054)	(0.055)	(0.055)	(0.057)
Macroeconomic variables					
Tax (τ)	-0.327***	-0.325***	-0.555***	-0.546***	-1.002***
	(0.114)	(0.114)	(0.121)	(0.121)	(0.136)
Law I	0.0819*	0.0689	-0.070	-0.109*	-0.495***
	(0.048)	(0.049)	(0.054)	(0.058)	(0.076)
Law II	Base group	Base group	Base group	Base group	Base group
Law III	0.404***	0.383***	0.359***	0.309**	0.170
	(0.121)	(0.123)	(0.125)	(0.127)	(0.136)
Inflation	0.188	0.278	1.220**	1.493**	0.219
	(0.539)	(0.546)	(0.571)	(0.584)	(0.686)
Number of banks/1000		-0.0699	0.405***	0.363***	0.5055***
		(0.0654)	(0.099)	(0.101)	(0.106)
$\frac{\text{Bad loans}}{\text{Total loans}}$			-1.614***	-1.678***	-3.377***
			(0.255)	(0.255)	(0.331)
GDP_{pc}				0.0132**	0.00691
				(0.00693)	(0.00788)
Sector variables	Yes	Yes	Yes	Yes	Yes
Customer variables	Yes	Yes	Yes	Yes	Yes
Regional dummies	No	No	No	No	Yes
Obs.	5502	5502	5502	5502	5502
Pseudo R^2	0.099	0.099	0.104	0.105	0.115

Notes: i. The predicted probability that the firm will be subsidized, i.e. $\Phi(Z\widehat{\theta})$, is computed using specification [E] in table 4.6.
ii. Murphy-Topel standard errors are in parentheses.
iii. *, ** and *** represent 10, 5 and 1% significance, respectively.

Table 4.8: Some marginal effects for the probability of grant

	[A] $\frac{\partial Loan}{\partial X}$	[B] $\frac{\partial Loan}{\partial X}$	[C] $\frac{\partial Loan}{\partial X}$	[D] $\frac{\partial Loan}{\partial X}$	[E] $\frac{\partial Loan}{\partial X}$
$\Phi(Z\hat{\theta})$	0.353***	0.348***	0.450***	0.325***	0.438***
	(0.099)	(0.099)	(0.10)	(0.12)	(0.12)
State	-0.270***	-0.268***	-0.278***	-0.261***	-0.284***
	(0.043)	(0.043)	(0.043)	(0.044)	(0.044)
Monopoly	-0.0959***	-0.0950***	-0.0990***	-0.0950***	-0.0974***
	(0.025)	(0.025)	(0.026)	(0.026)	(0.026)
1-3 competitors	Base group	Base group	Base group	Base group	Base group
4 or more competitors	-0.0454***	-0.0451***	-0.0408**	-0.0424**	-0.0360**
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Employees<50	-0.151***	-0.152***	-0.148***	-0.157***	-0.145***
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
50≤Employees<250	Base group	Base group	Base group	Base group	Base group
Employees≥250	0.142***	0.142***	0.146***	0.145***	0.147***
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Tax (τ)	-0.121***	-0.121***	-0.205***	-0.202***	-0.370***
	(0.042)	(0.042)	(0.045)	(0.045)	(0.050)
Law I	0.0304*	0.0256	-0.0259	-0.0403*	-0.178***
	(0.018)	(0.018)	(0.020)	(0.021)	(0.026)
Law II	Base group	Base group	Base group	Base group	Base group
Law III	0.137***	0.131***	0.123***	0.108***	0.0610
	(0.037)	(0.038)	(0.039)	(0.041)	(0.047)
Inflation	0.070	0.103	0.452**	0.553**	0.0809
	(0.20)	(0.20)	(0.21)	(0.22)	(0.25)
Number of banks/1000		-0.0259	0.150***	0.134***	0.187***
		(0.024)	(0.037)	(0.037)	(0.039)
$\frac{\text{Bad loans}}{\text{Total loans}}$			-0.597***	-0.621***	-1.25***
			(0.093)	(0.094)	(0.12)
$GDP_{pc}/1000$				0.00490*	0.00255
				(0.0026)	(0.0029)
WFSU					0.149***
					(0.029)
Cent					0.00470
					(0.028)
Caucasus					-0.250***
					(0.036)

Notes: i. The estimators are marginal effects at the mean values. The estimators presented in columns [A], [B], [C], [D] and [E] are associated with the *Loan* probits presented in columns [A], [B], [C], [D] and [E] of table 4.7, respectively.

ii. The predicted probability that the firm will be subsidized, i.e. $\Phi(Z\widehat{\theta})$, is computed using specification [E] in table 4.6.

iii. Standard errors are reported in parentheses.

iv. *, ** and *** represent 10, 5 and 1% significance, respectively.

Table 4.9: Does the tax rate capture subsidies? Probit models of table 4.7 with subsidies in percent of GDP as an additional explanatory variable

	[A]	[B]	[C]	[D]	[E]
	Loan	*Loan*	*Loan*	*Loan*	*Loan*
$\Phi(Z\hat{\theta})$	1.015***	1.003***	1.275***	0.886***	1.204***
	(0.269)	(0.269)	(0.279)	(0.324)	(0.339)
Tax (τ)	-0.210*	-0.211*	-0.445***	-0.422***	-1.042***
	(0.122)	(0.122)	(0.129)	(0.129)	(0.167)
$\left(\frac{\text{Subsidies}}{\text{GDP}}\right)$	-1.148***	-1.124***	-1.068***	-1.181***	0.226
	(0.422)	(0.423)	(0.426)	(0.426)	(0.550)
Coefficient probit on the tax rate in the regression of reference (table 4.7)					
	-0.327***	-0.325***	-0.555***	-0.546***	-1.002***
	(0.114)	(0.114)	(0.121)	(0.121)	(0.136)

Notes: i. The predicted probability that the firm will be subsidized, i.e. $\Phi(Z\widehat{\theta})$, is computed using specification [E] in table 4.6.
ii. The probit coefficients presented in columns [A], [B], [C], [D] and [E] are those of the specifications presented in columns [A], [B], [C], [D] and [E] of Table 4.7 with $\frac{\text{Subsidies}}{\text{GDP}}$ as an additional explanatory variable whatever the column.
iii. Murphy-Topel standard errors are in parentheses.
iv. *, ** and *** represent 10, 5 and 1% significance, respectively.

Table 4.10: Probit estimates of *Loan* when we exclude one country or a group of countries at a time

Country or group of countries excluded	Total tax rate (% of profit) in the country excluded	Probit coefficient on $\Phi(Z\hat{\theta})$	Murphy-Topel standard error	Marginal effect	Probit coefficient on Tax	Murphy-Topel standard error	Marginal effect	Obs.
[1] None		1.185***	0.335	0.437	-1.002***	0.136	-0.370	5502
[2] Belarus	186.1	1.294***	0.342	0.475	-0.673***	0.235	-0.247	5267
[3] Uzbekistan	106.3	1.274***	0.344	0.471	-1.082***	0.147	-0.400	5359
[4] Russia	70.0	1.166***	0.351	0.427	-0.963***	0.139	-0.352	5157
[5] Kyrgyz Republic	68.8	1.088***	0.337	0.401	-1.075***	0.142	-0.396	5363
[6] Ukraine	60.5	1.100***	0.337	0.406	-0.886***	0.141	-0.327	5119
[7] Hungary	60.5	1.659***	0.456	0.619	-1.003***	0.139	-0.374	5085
[8] Georgia	59.6	1.140***	0.339	0.421	-1.065***	0.138	-0.393	5395
[9] Romania	57.7	1.288***	0.344	0.477	-1.035***	0.138	-0.383	5105
[10] Albania	57.2	1.154***	0.333	0.426	-1.021***	0.136	-0.377	5379
[11] Lithuania	52.3	1.139***	0.337	0.421	-0.992***	0.137	-0.367	5377
[12] Czech Republic	51.8	1.157***	0.361	0.427	-0.980***	0.137	-0.361	5348
[13] Estonia	51.3	1.187***	0.339	0.440	-0.999***	0.136	-0.370	5383
[14] Moldova	51.1	1.015***	0.339	0.374	-1.236***	0.148	-0.456	5247
[15] Slovakia	51.0	1.188***	0.338	0.441	-1.011***	0.137	-0.375	5386
[16] Bosnia and Herz.	50.4	1.144***	0.337	0.424	-0.672***	0.234	-0.250	5375
[17] Azerbaijan	49.3	0.791**	0.339	0.288	-0.913***	0.136	-0.332	5370
[18] Kazakhstan	45.0	0.886***	0.343	0.326	-1.199***	0.159	-0.441	5089
[19] Bulgaria	43.5	1.404***	0.349	0.518	-1.013***	0.137	-0.374	5328
[20] Macedonia	43.5	1.139***	0.335	0.418	-0.920***	0.143	-0.338	5388
[21] Latvia	42.6	1.236***	0.340	0.458	-0.994***	0.137	-0.368	5379
[22] Armenia	42.5	0.968***	0.334	0.358	-0.915***	0.138	-0.338	5262
[23] Slovenia	39.4	1.191***	0.333	0.443	-0.973***	0.137	-0.362	5361
[24] Serbia	38.9	1.156***	0.339	0.426	-1.055***	0.148	-0.389	5307
[25] Poland	38.4	1.241***	0.353	0.450	-0.913***	0.145	-0.332	4876
[26] Croatia	37.1	1.074***	0.335	0.399	-1.040***	0.136	-0.387	5343
[27] WFSU		1.530***	0.376	0.554	-0.812***	0.244	-0.294	4284
[28] Central Asia		0.982***	0.353	0.361	-1.205***	0.160	-0.443	4807
[29] Caucasus		0.698**	0.343	0.254	-0.936***	0.139	-0.341	5023

Notes: i. The predicted probability that the firm will be subsidized, i.e. $\Phi(Z\hat{\theta})$, is computed using specification [E] in Table 4.6, excluding the specified country or group of countries.
ii. The marginal effects of $\Phi(Z\hat{\theta})$ and Tax are computed at the mean values.
iii. WFSU corresponds to Belarus, Moldova, Russia and Ukraine; Central Asia: Kazakhstan, the Kyrgyz Republic and Uzbekistan; Caucasus: Armenia, Azerbaijan and Georgia.
iv. *, ** and *** represent 10, 5 and 1% significance, respectively.

4.5 Conclusion

We have developed a SBC framework that explains that the misallocation of loans in some Eastern European countries is the result of governments' use of fiscal means to support some firms. Our model explains that banks are less likely to lend to firms when the tax rate is high. However, the firms that are more likely to be rescued by the government in case of trouble are less confronted to this problem because the possibility of bailout serves as an insurance.

Our empirical evidence, based on firm-level data, supports the model's predictions. We first find empirical evidence that politicians value these firms for their political support. Second, if there is an important negative impact of the tax rate on the probability of obtaining a loan, this negative effect is counterbalanced by the probability of obtaining subsidies. Not surprisingly, robustness checks have shown that the negative impact of tax rates is especially important in the countries of the Western former Soviet Union.

4.A Appendix of chapter 4: Proofs

Proof of lemma 1: By subtracting equation 4.4 to equation 4.3, we have:

$$B_b = \psi'(a_h^*) - \psi'(a_s^*) \tag{4.A1}$$

On the left-hand-side of equation 4.A1, $B_b > 0$. ψ' is a continuous increasing function. Thus, on the right-hand-side of equation 4.A1, $\psi'(a_h^*) - \psi'(a_s^*) > 0$ if and only if $a_h^* > a_s^*$.■

Proof of lemma 2: i) Applying the implicit function theorem to the first order conditions 4.3 and 4.4 which give the optimal level of effort of managers of type s and h, respectively, we obtain:

$$\frac{\partial a_j^*}{\partial \tau} = -\frac{(A_g - R)}{\psi''(a_j^*)} < 0 \ ,\forall j = \{h, s\} \tag{4.A2}$$

so a_j^* is decreasing in τ.

ii) Proceeding similarly for a_j^* in function of R, we obtain:

$$\frac{\partial a_j^*}{\partial R} = -\frac{(1 - \tau)}{\psi''(a_j^*)} < 0 \ ,\forall j = \{h, s\} \tag{4.A3}$$

and

$$\frac{\partial^2 a_j^*}{\partial R^2} = \frac{(1 - \tau)\frac{\partial a_j^*}{\partial R}\psi'''(a_j^*)}{[\psi''(a_j^*)]^2} < 0 \ ,\forall j = \{h, s\} \tag{4.A4}$$

so a_j^* is decreasing and concave in R. ■

Proof of lemma 3: Taking partial derivatives of the expected payoffs of managers h and s with respect to R, we obtain:

$$\frac{d}{dR}\pi_j^e(a_j, R) = \frac{\partial \pi_j^e}{\partial a_j}\frac{\partial a_j}{\partial R} + \frac{\partial \pi_j^e}{\partial R} \ , \forall j = \{h, s\} \tag{4.A5}$$

Because of the envelope theorem, $\frac{\partial \pi_j^e}{\partial a_j}\frac{\partial a_j}{\partial R}$ in equation 4.A5 can be ignored. Thus,

$\frac{d}{dR}\pi_j^e(a_j, R) = \frac{\partial \pi_j^e}{\partial R} = -a_j^*(1-\tau) < 0, \forall j = \{h, s\}$.■

Proof of lemma 4: The proof of the lemma follows the discussion or can be easily derived geometrically. Consequently, most of the proof is omitted. We only explain why the threshold $\bar{\tau}_h$ is determined by the exogenous parameters A_g, B_g, and S_m (it is useful for lemma 6). Consider equations 4.4 and 4.5. Remark that a_h^* is determined by the exogenous parameters A_g B_g and τ and by the endogenous parameter R. $\widehat{a}_h$ is determined by the exogenous parameter S_m and by the endogenous parameter R. Because a_h^* is decreasing and concave in R and $\widehat{a}_h$ decreasing and convex in R, there is a τ, called $\bar{\tau}_h$, such that there is a point of tangency between a_h^* and $\widehat{a}_h$. So resolving the following system

$$\begin{cases} a_h^* = \widehat{a}_h \\ \frac{\partial a_h^*}{\partial R} = \frac{\partial \widehat{a}_h}{\partial R} \end{cases}$$

gives $\bar{\tau}_h$ (and the corresponding $\widetilde{R}_h^*$) that will be a function of the exogenous parameters A_g, B_g, and S_m.■

Proof of lemma 5: Explanations of this lemma are similar to lemma 4. We only explain what are the exogenous parameters that determine $\bar{\tau}_s$. Consider equations 4.3 and 4.7. Remark that a_s^* is determined by the exogenous parameters A_g, B_g, B_b and τ, and by the endogenous parameter R. $\widehat{a}_s$ is determined by the exogenous parameter S_m and A_b, and by the endogenous parameter R. Because a_s^* is decreasing and concave in R and $\widehat{a}_s$ decreasing and convex in R, there is a τ, called $\bar{\tau}_s$, such that there is a point of tangency between a_s^* and $\widehat{a}_s$. So resolving the following system

$$\begin{cases} a_s^* = \widehat{a}_s \\ \frac{\partial a_s^*}{\partial R} = \frac{\partial \widehat{a}_s}{\partial R} \end{cases}$$

gives $\bar{\tau}_s$ (and the corresponding $\widetilde{R}_s^*$) that will be a function of the exogenous parameters A_g, B_g, B_b, S_m and A_b.■

Proof of lemma 6: i) Because of lemmas 4, we know that the exogenous parameters that determine $\bar{\tau}_h$ are A_g, B_g and S_m. Because of lemma 5, we know that these parameters, as well as two other exogenous parameters, A_b and B_b, determine $\bar{\tau}_s$. First the two following properties can be easily derived geometrically:

$$\frac{\partial \bar{\tau}_s}{\partial B_b} < 0 \text{ and } \frac{\partial \bar{\tau}_s}{\partial A_b} > 0 \tag{4.A6}$$

Now let's consider $Z(B_b, A_b) = \bar{\tau}_s(B_b, A_b) - \bar{\tau}_h = 0$. This equation describes a curve in the (B_b, A_b) plane. Z cannot be solved explicitly so we use the implicit function theorem to determine the slope of the curve it defines:

$$\frac{\partial A_b}{\partial B_b} = -\frac{\frac{\partial Z}{\partial B_b}}{\frac{\partial Z}{\partial A_b}} = -\frac{\frac{\partial \bar{\tau}_s}{\partial B_b}}{\frac{\partial \bar{\tau}_s}{\partial A_b}} > 0 \tag{4.A7}$$

because of properties 4.A6. Thus Z determines an upward sloping curve in the (B_b, A_b) plane. If the specificity of the firms s on the loan market belongs to the set of points (B_b, A_b) that lie above the graph of this curve, $\bar{\tau}_s > \bar{\tau}_h$. If it belongs to the set of points (B_b, A_b) that lie below the graph of this curve, $\bar{\tau}_h > \bar{\tau}_s$. Then, we show that the upward sloping curve described by Z crosses the origin in the (B_b, A_b) plane. In the double limit zero personal benefit for a subsidized bad projects ($B_b \to 0$) and zero output for a subsidized bad project ($A_b \to 0$), we have:

$$\lim_{(B_b, A_b) \to (0,0)} \bar{\tau}_s = \bar{\tau}_h$$

This result is obvious given that B_b only influences a_s^*. Because of equation 4.A1, we know that $a_s^* \to a_h^*$ when $B_b \to 0$. Concerning A_b, it only influences $\widehat{a}_s$. Compare equations 4.5 and 4.7, and remark that $\widehat{a}_s \to \widehat{a}_h$ when $A_b \to 0$. Consequently, $\bar{\tau}_h$ is the double limit of $\bar{\tau}_s$ when $(B_b, A_b) \to (0, 0)$. So the upward sloping curve described by Z crosses the origin in the (B_b, A_b) plane.

ii) If (B_b, A_b) belongs to the set of points that lie above the graph of this curve, then $\bar{\tau}_s > \bar{\tau}_h$. Consequently, condition 4.6 ($\tau < \bar{\tau}_h$) is more demanding than condition

4.8 ($\tau < \bar{\tau}_s$). ■

Chapter 5

General conclusion

This thesis emphasizes three aspects of the relationships between ownership and soft budget constraints.

In chapter 2, we highlight that policymakers should consider carefully when recommending mass privatization. In an econometric setting close to the macroeconomic empirical literature on trajectories in transition economies, we show that privatization by gradual sales always has a positive and significant impact on GDP, while privatization by massive giveaways has no impact. This chapter complements the work of Zinnes *et al.* (2001) who find that privatization has no impact if a competitive hard-budget environment and good corporate governance are not sufficiently developed and functioning. Indeed, a strategy of gradual sales necessitates preprivatization restructuring to attract strategic investors. Thus, before to privatize *via* gradual sales, the state has to reestablish its control and harden the budget constraint to avoid waste. In countries that have quickly privatize, there has been a tendency to eliminate state ownership as fast as possible, with the consequence of privatization in the form of giveaway to insiders or citizens becoming the policy imperative. In these countries, the budget constraint has usually been soft. Our findings are echoed in a recent contribution of Godoy and Stiglitz (2006): they find that the speed of privatization is negatively associated with growth.

Chapter 3 proposes an empirical work on the soft budget constraint. This chapter is important because empirical research on soft budget constraints is still in its infancy. It is often said that an empirical measure of soft budgets has to capture the expectations of enterprise managers of a future bail-out in case of trouble, not a current policy. This chapter comes close to the prescribed measure by studying managers' beliefs to have an extension of the term of their loan in case of trouble. Furthermore, we highlight that self-reported measures of beliefs reflect an important element of reality: our results suggest that if a firm believes it will be rescued in case of trouble, it will become less responsive to the prices of its inputs. This chapter is also important because we find that firms owned by employees in the CIS countries are more likely to anticipate an extension if they fall behind in their bank repayments. This result is in line with our results of chapter 2 and those of ZES that suggest that countries in the FSU do not have institutions to address hardening of budget constraints.

Chapter 4 builds on SBC models *à la* Dewatripont and Maskin (1995) to explain why banks tend to give preferences to distressed firms, particularly in the FSU. First and contrarily to the model of Dewatripont and Maskin (1995), we consider that the banks have no intrinsic interest in refinancing. It is a third party, the government, that has an interest *ex post* in keeping unprofitable firms afloat. Second, we assume that firms that obtain good projects are taxed. As a consequence, firms that have a SBC might be more likely to obtain loans than firms with a HBC. Our empirical findings show a quantitatively important positive effect of the probability of obtaining subsidies and important negative effect of the tax rate, particularly in the FSU.

The most important policy implication of our thesis is that privatization *per se* does not guarantee improved performance. Policymakers should consider carefully when recommending quick privatization if the requisite legal and institutional system, in particular necessary conditions for a HBC, is not sufficiently developed and functioning. The necessity of hardening the budget constraint on enterprises in coun-

tries in transition has clearly been recognized in the literature since the beginning of transition. Our analysis suggests that countries in the FSU are still not meeting this condition.

A representative survey of Russia's population in 2006 found that fifty two percent of respondents agree with the statement "the majority of private assets in the country should be nationalized" (Denisova *et al.*, 2007). Using another survey of more than 28,000 respondents, Denisova *et al.* (2007) show a high level of public support for revising privatization in 28 post-communist countries. It is particularly the case in countries with poor governance institutions; given what we said all along this thesis, it is hardly surprising. The consequence is that recent years have seen some significant reversals of privatization in Kazakhstan, Russia and Ukraine. Countries of the FSU are not exceptions: re-nationalizations have also occurred in Bolivia, Venezuela and elsewhere in the developing world.

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List of abbreviations

BC: budget constraint
BEEPS: Business Environment and Enterprise Performance Survey
CIS: Commonwealth of Independent States
EBRD: European Bank for Reconstruction and Development
FSU: former Soviet Union
GDP: gross domestic product
HBC: hard budget constraint
IMF: International Monetary Fund
MEBO: management employee buy out
MEL: macroeconomic empirical literature on the relative importance of initial conditions, macroeconomic stabilization and liberalization in transition economies
SBC: soft budget constraint
SOE(s): state-owned enterprise(s)
WFSU: Western former Soviet Union (Belarus, Moldova, Russia, Ukraine)

Chapter 6

Introduction-Résumé long

Au cours des deux dernières décennies, des programmes de privatisation des firmes publiques ont été très largement mis en oeuvre dans de nombreux pays quel que soit leur stade de développement économique. Demsetz (1998) souligne que c'est l'écroulement du bloc soviétique entre 1989 et 1991 qui a marqué ce tournant. Selon Megginson et Netter (2001), c'est le succès apparent des privatisations réalisées par le gouvernement Thatcher en Grande-Bretagne au début des années 1980 qui a convaincu de nombreux pays de faire de même. Il est difficile de dire qui a raison. Ce qu'il faut néanmoins remarquer c'est qu'il n'y avait aucune justification théorique sérieuse à ces transfets de propriété (Demsetz, 1998, Megginson et Netter, 2001, Schmidt, 1996b). Quand le gouvernement britannique lança son programme au début des années 1980, la plupart des économistes étaient sceptiques : ils considéraient que la propriété publique devait être préférée dès qu'il y avait des imperfections de marché. Les gouvernements devaient donc au moins posséder les télécommunications, les services postaux, les distributions de gaz et d'électricité, les infrastructures ferroviaires et portuaires ainsi que les aéroports (Megginson et Netter, 2001, Shleifer, 1998). Dans les pays d'Europe de l'Est, le processus de privatisation était différent. Il s'agissait de redéfinir les droits de propriété pour des milliers d'entreprises opérant

dans des secteurs concurrentiels. A la suite de l'écroulement du système planifié, la plupart des économistes reconnaissait qu'une privatisation de grande ampleur était nécessaire (Kornai, 1990, Lipton et Sachs, 1990b). Cependant une minorité de théoriciens, comme Bardhan et Roemer (1992), soulignaient qu'il n'avait jamais été démontré que la propriété privée était nécessaire pour avoir une économie efficiente[1]. En outre, même si une majorité d'économistes pensaient qu'une privatisation de grande ampleur était nécessaire, il n'y avait pas de consensus sur la manière de privatiser. Certains, comme Boycko *et al.* (1995) ou Lipton et Sachs (1990b), pensaient qu'une privatisation accélérée était nécessaire pour réaliser une rapide percée vers l'économie de marché. Boycko *et al.* (1995) soutenaient que la seule méthode de privatisation politiquement acceptable, du moins en Russie, était de remettre la propriété des entreprises au personnel et aux *managers* (privatisation de masse aux *insiders*). Lipton et Sachs (1990b) conseillaient eux de privatiser par distribution quasi gratuite des bons à la population (privatisation de masse à la population). Quant à Bolton et Roland (1992), ou encore Kornai (1990b), ils conseillaient plutôt des ventes au cas par cas, ce qui impliquaient une restructuration au préalable pour attirer des acheteurs potentiels.

Il semblait assez difficile pour la théorie économique de prévoir dans quelles circonstances la propriété privée devait être préférée à la propriété publique. Les partisans de la privatisation, en particulier les économistes conseillant des privatisations de masse dans les pays en transition, se limitaient souvent à répéter l'argument suivant : contrairement à une firme privée, une entreprise publique n'est pas soumise à la discipline du processus de banqueroute parce que l'Etat vient toujours la secourir si elle fait face à des difficultés financières. Anticipant l'aide du gouvernement

[1] Stiglitz (1994) était également très méfiant en ce qui concerne l'importance accordée à la nécessité de privatiser. Il soulignait qu'il fallait également tout faire pour rendre l'économie concurrentielle et développer un système financier de qualité.

en cas d'insolvabilité, les *managers* de ces entreprises ont des incitations plus faibles que ceux du secteur privé. Les entreprises publiques ont donc ce que Kornai (1979) appelle une contrainte de budget "lâche". Cependant, rien n'interdit de fermer des entreprises publiques, même si on s'attend à ce que cela soit moins fréquent que pour une entreprise privée. De plus, il arrive que les gouvernements secourent certaines entreprises privées (Laffont et Tirole, 1991).

Formulé initiallement par Kornai (1979) pour expliquer les problèmes de pénurie dans les économies socialistes, le concept de contrainte budgétaire lâche (CBL) est toujours invoqué dans les économies en transition. Deux raisons peuvent l'expliquer. La première est que les problèmes de contrainte budgétaire lâche sont toujours présents dans de nombreux pays en transition, malgré de nombreuses privatisations. Cela pourrait paraître surprenant, car, à l'exception des pays de l'ex-URSS, les subventions des gouvernements aux entreprises ont été largement réduites. Cependant, le laxisme budgétaire a continué via les arriérés de salaires, et surtout le crédit bancaire. Les prêts bancaires aux entreprises en difficultés sont d'ailleurs considérés comme le moyen dominant d'assouplir la contrainte budgétaire dans de nombreux pays en transition (Kornai, 2001, Kornai *et al.*, 2003, Roland, 2000). La deuxième raison qui peut expliquer le fait que ce concept soit toujours autant d'actualité est que les articles théoriques qui ont cherché à trouver les raisons d'une contrainte budgétaire lâche ne sont apparus que durant les années 1990. Comme nous le verrons dans cette introduction, certains de ces modèles soulignent la distribution des droits de propriété comme cause fondamentale (par exemple Boycko *et al.*, 1996). D'autres se focalisent sur les problèmes d'allocation des prêts bancaires (par exem-

ple Dewatripont et Maskin, 1995)[2].

Cette thèse se focalise essentiellement sur les économies en transition. Cependant, avant de présenter les objectifs de cette thèse, notons que les phénomènes de privatisation et les problèmes de contraintes budgétaires lâches concernent également les pays en développement et les pays développés. Huang et Xu (1999) ont interprété les risques de contagion et de crises financières, notamment la crise financière asiatique de 1997 à partir du concept de CBL. La littérature portant sur le financement des entreprises a également décelé un certain nombre de canaux de transmission de ce phénomène tant dans les pays post-socialistes (Berglof et Roland, 1998) que dans les pays capitalistes avancés (Dewatripont et Maskin, 1995). Les entreprises d'Etat dans certains pays européens manifestent aussi certains symptômes du phénomène. A titre d'exemple, nous pouvons évoquer l'Italie (Bertero et Rondi, 2000). La transition peut également être considérée comme un laboratoire unique qui peut offrir de profonds enseignements pour les sciences économiques et pour les politiques de privatisations dans d'autres pays qui ont encore de grands programmes de privatisations à mettre en place. Nous pensons particulièrement à la Chine et l'Inde. La Chine a commencé sa transition en 1979 lorsqu'elle a introduit pour l'agriculture une libéralisation à deux régimes de ses prix (*dual track price liberalization*). Depuis 1995, de nombreuses privatisations de petites et moyennes entreprises ont lieu (Qian, 2000). Cependant, la plupart des grandes entreprises n'ont pas été privatisées et sont confrontées à des problèmes de CBL. L'Inde a également lancé un programme pour

[2] Notons également que, durant les années 1990, plusieurs modèles théoriques ont tenté d'expliquer une plus grande efficacité/inefficacité des entreprises publiques par rapport aux entreprises privées. Comme dans un monde de contrat complet avec un gouvernement bienveillant, la propriété ne compte pas (Sappington et Stiglitz, 1987, Stiglitz, 1994), les modèles se sont fondés soit sur l'incomplétude des contrats (Laffont et Tirole, 1991, Schmidt, 1996a,b), soit sur la malveillance des gouvernements (Shleifer et Vishny, 1994, Boycko *et al.*, 1996). Certains de ces modèles seront décrits plus en détails par la suite car ils expliquent pourquoi les entreprises publiques ont une plus grande probabilité d'avoir une CBL (en particulier Schmidt, 1996a,b, Shleifer et Vishny, 1994, Boycko *et al.*, 1996).

réformer son économie à partir de 1991, les performances des entreprises publiques étant décevantes (Majumdar, 1996). Mais les privatisations ont été ralenties (voir Banerjee *et al.*, 2005, Dinç and Gupta, 2007).

Nous avons trois objectifs dans cette thèse. Notre premier objectif est d'étudier l'impact des privatisations sur les performances macroéconomiques dans les économies en transition. La plupart des économistes étaient d'accord pour dire que la privatisation aurait un large impact sur l'*output*, voire sur les taux de croissance des économies en transition. Or, López et Sheshinski (2003) signalent qu'il n'y a aucune preuve macroéconométrique de l'impact des privatisations dans les économies en transition. Maintenant qu'un important laps de temps s'est écoulé depuis le début de la transition, un nombre suffisant de données est disponible pour étudier cette question. Nous regarderons en particulier l'impact de la privatisation en fonction des méthodes dominantes de privatisation mises en place par les différents pays. Une question sous-jacente est de savoir si certaines méthodes de privatisation sont concomitantes avec un durcissement de la contrainte budgétaire.

Notre deuxième objectif est alors de proposer une recherche empirique sur les déterminants de la CBL. Malgré les progrès réalisés depuis dix ans pour expliquer le phénomène, les travaux empiriques sur le sujet n'en sont encore qu'à leurs débuts (Roland, 2000; Djankov et Murrell 2002). Une mesure empirique doit prendre en compte les anticipations des *managers* sur une aide probable en cas de difficultés financières, ce qui nécessite des enquêtes spécifiques. Si les subventions et les mauvais prêts sont à l'occasion pris comme indicateur, Qian et Roland (1998, p.1143) soulignent que ces variables ne peuvent pas être considérées comme un bon indicateur du phénomène. En effet, des entreprises peuvent être aidées par un gouvernement, mais on ne peut pas parler de contrainte molle si ces aides n'ont pas été anticipées par les *managers*. Le syndrome de CBL n'a lieu que si les managers anticipent que leur firme

sera aidée en cas de difficultés financières, ces anticipations affectant par la suite les réactions de l'entreprise. Notre travail empirique étudie quelles firmes anticipent d'avoir une extension de prêt en cas de difficultés financières. Notre conception de la CBL est donc très proche de celle des modèles théoriques à la Dewatripont et Maskin (1995)[3].

Les problèmes de CBL semblent particulièrement importants dans les pays de l'ex-URSS. D'une part, les banques favorisent les entreprises perpétuellement déficitaires dans l'allocation des prêts bancaires (Brana *et al.*, 1999; Huang *et al.*, 2004; EBRD, 2006). Cela est très surprenant car le nombre de banques privées est très important, particulièrement en Russie. D'autre part, l'imposition des profits des entreprises est très élevée dans ces pays, ce qui a généré une litérature conséquente sur les problèmes d'externalités fiscales, c'est-à-dire des situations où les taxes sont tellement élevées que les producteurs n'innovent plus ou ne travaillent plus. Notre troisième objectif est alors de proposer un modèle de CBL qui explique à la fois l'externalité fiscale et la mauvaise allocation des prêts, ce dernier élément en étant une conséquence. Plusieurs implications de notre cadre d'analyse seront testées empiriquement.

Avant de présenter plus en détail les apports de cette thèse, il semble indispensable, pour débuter cette introduction, de faire un bref rappel historique des privatisations, et d'expliquer pourquoi les problèmes incitatifs, en particulier la CBL, peuvent être plus importants dans les entreprises publiques.

[3] Les intuitions de ce modèle seront brièvement présentées par la suite.

6.1 Histoire et géographie de la privatisation

Le premier grand programme de privatisation est généralement attribué, du moins dans les pays développés, au gouvernement Thachter au début des années 1980[4]. Il a certainement été le plus important dans les pays développés. Le poids des entreprises nationales dans le produit intérieur brut de la Grande-Bretagne passera de plus de 10% à un niveau quasi nul en 1997. L'expérience britannique va convaincre d'autres pays industrialisés, qui à leur tour vont s'engager dans la voie de la privatisation. De 1986 à 1988, le gouvernement Chirac a ainsi privatisé 22 entreprises. Les gouvernements socialistes qui suivent ne continuent pas dans la voie de la privatisation tout en refusant de renationaliser les firmes cédées. En 1993, le gouvernement Balladur lance à nouveau un programme important de privatisation, poursuivi par le gouvernement Jospin. D'autres gouvernements en Europe (Italie, Allemagne, Espagne) ont également lancé de grands programmes de privatisation dans les années 1990[5].

De nombreux Pays en Développement ont également abandonné les stratégies de développement fondées sur l'idée d'un *big push* qui justifiait une politique publique volontariste pour s'industrialiser[6]. Selon Buffie (1998), la raison principale de cet abandon est que les entreprises publiques présentent d'importants sureffectifs[7]. En

[4] Megginson et Netter (2001, p.323) remarquent cependant qu'il y avait eu des précédents : la privatisation partielle de Volkswagen en 1961 en Allemagne et la dénationalisation de l'acier britannique au début des années 1950 qu'ils considèrent comme le premier programme de privatisation. Néanmoins, cela a été remis en cause par les travaux d'histoire économique de Bel (2006, 2007). Il montre que le premier programme de privatisation est attribuable à l'Allemagne nazie entre 1933 et 1937.

[5] En ce qui concerne l'Italie, Bertero et Rondi (2000) étudient un échantillon d'entreprises publiques sur la période 1977-1993. Ils montrent que la productivité des entreprises publiques a largement augmenté à la suite de la baisse des subventions et des prêts bancaires à la fin des années 1980 (probablement le résultat des pressions de l'Union Européenne pour réduire les aides de l'Etat et accélérer les programmes de privatisations).

[6] Cette stratégie a largement été inspirée des travaux de Rosenstein-Rodan (1943), formalisée par la suite par Murphy *et al.* (1989).

[7] Signalons que les sureffectifs des entreprises publiques peuvent être considérés comme une conséquence de la CBL. Selon Kornai (1980), les firmes publiques ont une CBL et sont donc très peu sensibles aux prix de leurs intrants. Leur demande d'employés est donc excessive par rapport à une situation de contrainte budgétaire dure.

Amérique Latine, le premier grand programme de privatisation a concerné le Chili, lorsque Pinochet renversa le gouvernement Allende[8]. D'autres pays comme l'Argentine, la Bolivie et le Mexique ont également entrepris des programmes de privatisations à partir des années 1990[9].

Megginson et Netter (2001) rapportent également qu'en Afrique, le nombre de privatisations est plus important qu'on ne le croit généralement. Le Bénin, la Guinée et le Mali ont par exemple privatisé de nombreuses entreprises publiques entre 1980 et 1995 (Bennell, 1997). Cependant, les Etats Africains ont été lents dans leur processus de privatisation. En moyenne, l'Afrique n'a privatisée qu'un faible pourcentage (environ 40%) de ces entreprises publiques, par rapport à d'autres régions comme l'Amérique Latine et les pays en transition. De nombreuses entreprises restent publiques en raison d'une opposition des travailleurs aux privatisations[10], et du manque de transparence dans les transactions[11].

Reste une région, et non des moindres lorsqu'on s'intéresse aux questions de privatisation, les pays d'Europe Centrale et Orientale (PECO), ainsi que l'ex-URSS. Après la chute des régimes communistes (1989-1991), la plupart des nouveaux gouvernements de la région se sont en effet attachés à essayer de construire une économie de marché aussi vite que possible. Il y avait certainement des similarités avec le

[8] Immédiatement après le coup d'Etat de septembre 1973, la nouvelle équipe économique entreprit une première vague de privatisation dont le but était de restituer les entreprises nationalisées sous le régime Allende. La volonté de transformation radicale de l'économie et les besoins de financement ont donné lieu à une deuxième vague de privatisation de 1975 à 1979 (voir Larraín et Winograd, 1996).

[9] Le lecteur intéressé peut lire l'article de La Porta et López-de-Silanes (1999) pour le Mexique. Le cas bolivien est brièvement décrit dans l'article de Megginson et Netter (2001, p.326). Les privatisations en Argentine sont largement décrites dans l'article de Larraín et Winograd (1996).

[10] Bennell (1997) rapportent que c'était particulièrement le cas au Ghana et en Tanzanie durant les années 1990.

[11] Nellis (2005) propose une discussion détaillée des privatisations en Afrique. Si de plus en plus d'études concernant l'impact des privatisations en Amérique Latine et dans les pays d'Europe de l'Est sont disponibles, de telles études sont très rares pour l'Afrique. Le peu d'études existantes rapportent que les firmes privatisées sont plus efficientes et contribuent à l'amélioration du bien-être. Jones *et al.* (1998) analyse 81 privatisations en Côte d'Ivoire, celles-ci concernant le secteur électrique ainsi que plusieurs industries agro-alimentaires. Concernant la provision d'eau en Guinée, Ménard et Clarke (2002, p.274) soulignent que les réformes ont amélioré la qualité.

gouvernement Thatcher du Royaume-Uni et le Chili post-Allende, mais le contrôle étatique sur l'activité économique était bien plus important[12]. Dans les économies socialistes une large proportion des privatisations concernait des entreprises opérant dans des secteurs concurrentiels. Lipton et Sachs (1990a, p.127) soulignaient d'ailleurs:

> "*Prime Minister Margaret Thatcher, the world's leading advocate of privatization, has overseen the transfer of a few dozen state enterprises to the private sector in the past decade. Poland, however, has more than 7800 candidates for privatization.*"

Les faiblesses des entreprises publiques dans les pays de l'est étaient similaires à ceux dans les pays développés et en développement. Au nombre de celles-ci, mentionnons les sureffectifs flagrants, le gaspillage des ressources, la faible productivité des facteurs et les défauts d'incitations que l'on peut considérer comme une conséquence de la CBL. Soulignons que pour remédier à ces défauts, de nombreuses réformes se sont succédées dans la plupart des pays du bloc socialiste. Elles ont consisté à déléguer certains droits de décisions aux *managers*. La raison est que les dirigeants d'entreprises possédaient une meilleure information sur leur activité que le planificateur. Les résultats de ces mesures ont été décevants. L'Etat a conservé les droits de propriété résiduels. La responsabilité des dirigeants restant faible, ceux-ci n'internalisaient pas pleinement la conséquence de leurs actions.

Au début de la transition, Kornai (1990b) argumentait alors que pour avoir une propriété effective, les enterprises devaient être vendues à des propriétaires clairement définis. Cependant, les ventes au cas par cas risquaient d'être lentes car elles imposaient d'évaluer et de restructurer les entreprises avant de les proposer à des acheteurs potentiels. De nombreux chercheurs et conseillers économiques ont alors

[12] En 1990, les pays dont la part du secteur privé dans le PIB était la plus élevée était la Croatie (15%), la Hongrie (25%) et la Pologne (30%) (EBRD, 1999).

proposé des méthodes novatrices, comme les privatisations de masse[13].

Plusieurs modèles macroéconomiques ont d'ailleurs analysé la transition comme un processus de réallocation d'un secteur public inefficient à un secteur privé très productif. Les modèles d'Aghion et Blanchard (1994) et de Roland et Verdier (1994) sont des exemples typiques de ce genre de modèles bisectoriels. Dans ces deux modèles, les entreprises privatisées sont supposées plus efficientes. Aghion et Blanchard (1994) considèrent que les employés du secteur privé ont une productivité marginale supérieure à ceux du secteur public. Pour Roland et Verdier (1994), les firmes publiques ont des difficultés financières car elles versent des salaires supérieurs à leurs recettes. Elles ont donc une CBL, les dépenses de l'entreprise excèdant de façon permanente leurs revenus (Kornai, 1998)[14]. Cependant ces auteurs soulignent en général que l'hypothèse de firmes privées plus efficientes n'est pas forcément évidente. En particulier, Aghion et Blanchard (1994, p.294) notent:

> "*We make no distinction between privatization and restructuring. But* [...] *the relation between privatization and restructuring is much less tight than we assume here.*"

[13] Parmi ces derniers, citons Blanchard *et al.* (1991), Boycko *et al.* (1995) ou encore Frydman et Rapaczyinski (1991).

[14] Une autre hypothèse commune à ces deux modèles est que la privatisation entraîne des licenciements, les nouveaux propriétaires devant restructurer et donc éliminer les sureffectifs. Le planificateur social qui maximise le bien être des travailleurs a alors un *trade-off* à faire. Signalons que d'autres modèles macroéconomiques composés d'un secteur public et d'un secteur privé existent, comme Brandt et Zhu (2001) et Myiamoto et Yu (2000). Néanmoins ces modèles ne sont pas des modèles de réallocation de la main d'oeuvre.

6.2 Privatisation, inefficience et contrainte budgétaire lâche

La citation d'Aghion et Blanchard souligne bien le fait qu'il n'y avait pas ou peu d'analyses théoriques sur les coûts et bénéfices de la privatisation. Il est communément admis que les entreprises privées sont plus performantes que les entreprises publiques en raison de meilleures incitations données aux dirigeants et employés. Mais si cela était vrai, la question serait alors de savoir pourquoi un gouvernement ne peut pas atteindre le même niveau de performance en imitant le propriétaire privé, c'est-à-dire en lui proposant le même contrat incitatif (Williamson, 1985). En outre, une firme publique peut choisir un niveau de production socialement plus efficient si le gouvernement maximise le bien-être général. Une entreprise privée ne maximise que ses profits.

Nous expliquons d'abord deux arguments habituels avancés dans les débats sur la privatisation. Le premier est le problème d'agence et le deuxième celui de CBL. Nous verrons leur ambiguïté. Nous verrons ensuite que la difficulté du sujet reste assez profonde d'un point de vue théorique et doit faire appel aux coûts de transaction et à la théorie des contrats incomplets. Nous nous focalisons particulièrement sur les modèles de CBL qui traitent de la propriété des firmes. Nous présentons également les modèles qui se focalisent sur l'allocation des crédits bancaires car cela nous permettra de montrer plus facilement nos apports par la suite.

Le problème d'agence

Les problèmes d'agence arrivent lorsque le *manager* maximise sa propre utilité et non celle du propriétaire de la firme. Ce problème d'agence est clairement absent dans les petites entreprises où le propriétaire dirige lui-même l'entreprise.

Remarquons que la séparation entre propriété et contrôle arrive également pour

les grandes entreprises privées. Les dirigeants des grandes entreprises privées devraient donc être également tentés des maximiser leurs propres intérêts et non ceux des actionnaires.

Cependant, l'argument est ici que les grandes entreprises privées contrairement aux entreprises publiques sont côtées en bourse. Les prix des actions contiennent de l'information sur les perspectives à long terme des entreprises et donc sur les décisions prises par les *managers*. Ensuite, les entreprises publiques ne peuvent pas être soumises à des offres publiques d'achat et donc leurs *managers* sont moins soucieux de perdre leur emploi.

A cet argument on peut remarquer que le gouvernement peut décider de garder une partie des actions de l'entreprise pour bénéficier de l'information générée par les transactions sur les titres détenus par le public. Ensuite, il faut souligner que les économistes n'ont jamais démontré qu'une bourse des valeurs est l'instrument le plus efficace pour obtenir de l'information sur la santé d'une entreprise (Laffont et Tirole, 1991).

Le problème de la contrainte budgétaire lâche

Le second argument simpliste contre la propriété publique est l'argument de CBL. La difficulté avec cet argument est que rien n'interdit de fermer des entrperises publiques, même si l'on s'attend à ce que cela soit moins fréquent que pour une entreprise privée. De plus, Sappington and Stiglitz (1987) soulignent que les gouvernements secourent certaines entreprises privées. Même Kornai (1980, 2000, 2001) qui a souvent souligné la forte relation entre propriété publique et CBL souligne que cette dernière peut apparaître dans des économies où la plupart des entreprises sont privées.

Dans ces premiers travaux, il souligne le rôle paternaliste de l'Etat dans les économies socialistes pour expliquer la CBL. L'entreprise et les travailleurs sont à

l'égard de l'Etat comme des enfants. L'entreprise est protégée et elle ne tombera pas en faillite, et les travailleurs conservent leur emploi (Kornai, 1979). Pour Kornai (1998, p.537), cette explication est donc systémique, elle découle de l'idéologie du système socialiste.

Cependant cet argument a été critiqué par Maskin (1996). Une société socialiste peut pour des raisons idéologiques vouloir espérer le plein emploi ; cela aurait contraint les Etats d'Europe de l'Est à sauver les entreprises non performantes. Cependant, Maskin (1996, p.126), paraphrasant Marx, souligne que l' "*idéologie est seulement le reflect de la structure économique sous-jacente*". Un économiste souhaite une explication fondée sur les différences économiques et non idéologiques entre le socialisme et le capitalisme. De plus, les phénomènes de CBL ont perduré dans les économies en transition, tout particulièrement dans celles qui avaient privatisé rapidement leurs actifs (voir par exemple les cas tchèque et russe, Kornai, 2000).

Nous avons donc deux puzzles à expliquer. Le premier est pourquoi une entreprise privée ou privatisée a plus de chance d'avoir une CBL. Ce premier puzzle fait parti d'une question plus générale qui est pourquoi les entreprises privées seraient-elles plus efficaces que les entreprises publiques. Le second puzzle est pourquoi le phénomène de CBL peut exister alors que les entreprises sont privées. Il s'agit de savoir s'il y a d'autres raisons que la distribution des droits de propriété qui peuvent expliquer ce phénomène.

6.2.1 Droits de propriété et contrainte budgétaire lâche

Sappington et Stiglitz (1987) soulignent que la séparation entre propriété et contrôle touche aussi bien les entreprises publiques que les entreprises privées. Cependant, ils soulignent que deux arguments peuvent expliquer les meilleures (ou moins bonnes)

performances des entreprises publiques. Tout d'abord, la propriété publique réduit les coûts d'intervention dans la gestion des firmes. Cela rend l'intervention dans une entreprise publique plus facile. De plus, la propriété ne joue aucun rôle dans un monde de contrats complets avec une constitution bienveillante maximisant le bien-être social (Grossman et Hart, 1986, Sappington et Stiglitz, 1987). Ce qui est possible avec une entreprise privée devrait l'être également avec une entreprise publique *via* un contrat adéquat. Certains modèles théoriques microéconomiques expliquant une plus grande efficience/inefficience des entreprises publiques se sont donc focalisés également sur l'incomplétude des contrats.

L'intervention des gouvernements dans la gestion des firmes, les droits de propriété et la contrainte budgétaire lâche

Sappington et Stiglitz (1987) soulignent que la plus grande différence entre les entreprises publiques et privées résident dans les coûts de transactions auxquels fait face le gouvernement s'il souhaite intervenir dans la gestion d'une firme. Sous un régime de propriété publique, le gouvernement a les droits de contrôle; cela lui coûte donc moins cher d'intervenir dans la gestion d'une entreprise si celle-ci est publique.

L'idée qu'il est moins couteux pour un homme politique d'intervenir dans la gestion des firmes publiques est au coeur des modèles de Boycko *et al.* (1996) et Shleifer et Vishny (1994). En faisant l'hypothèse que les hommes politiques sont "malveillants", ils expliquent pourquoi il peut y avoir des sureffectifs dans les entreprises publiques. Ils réactualisent par la théorie des jeux une idée déjà présente chez les anciens théoriciens des droits de propriété[15]: quand la propriété est publique, les hommes politiques ont les droits de contrôle et ne supportent pas pleinement les conséquences de leurs actions car c'est le trésor public qui a les droits résiduels sur le profit. De ce fait, ils interviennent dans la gestion de la firme afin de réaliser des

[15] Voir, par exemple, Demsetz (1998).

objectifs qui sont contraires à l'efficacité, par exemple embaucher des sureffectifs, pour être réélu. Dans leur modèle, il y a donc trois joueurs: un politicien, le trésor public, qui est passif, et un manager représentant bienveillant des actionnaires privés. Deux niveaux d'emploi sont possibles: H et L avec $H > L$. Pour que l'entreprise soit efficiente, elle doit embaucher L. Le politicien a une préférence pour un niveau d'emploi H afin d'obtenir plus de votes aux élections. Quand l'entreprise est publique, c'est lui qui dispose des droits de contrôle mais les droits résiduels sur le profit sont alloués au trésor. Le trésor peut certes imposer des sanctions aux politiciens si l'entreprise publique fait des pertes mais il coûte moins à l'homme politique d'utiliser l'argent du trésor que son propre argent. Quand l'entreprise est privée, c'est le manager qui a les droits de contrôle et les droits résiduels sur le profit. Celui-ci, en tant que représentant fidèle des actionnaires, souhaite embaucher peu de travailleurs. Pour forcer le manager à surembaucher, le politicien peut chercher à le subventionner. Comme il est plus difficile d'extraire des subventions du trésor que de gaspiller le profit, cela lui coûte plus cher par rapport à une situation de propriété publique. Il est donc plus difficile pour lui d'avoir un niveau d'emploi élevé. Il est donc plus probable que les entreprises privées soient plus efficientes que les entreprises publiques.

Deux critiques peuvent être adressées à ces modèles. Premièrement, ils sont souvent considérés comme des modèles de CBL. Cette dernière est donc perçue comme souhaitable par les politiciens car elle leur permet d'influencer le niveau d'emploi à leur guise. Mais dans cette définition de la CBL, les problèmes incitatifs des managers sont totalement absents.

Une autre grande faiblesse des modèles de Boycko *et al.* (1996) et de Shleifer et Vishny (1994) réside dans le fait qu'on peut les interpréter de manière diamétralement opposés (Kornai *et al.*, 2003, p.1128 et Roland, 2000, p.203). En effet,

nous pouvons argumenter que L est un niveau d'emploi sous optimal et que les entreprises privées n'internalisent pas les coûts sociaux du chômage $(H - L)$. La propriété publique est alors un moyen d'arriver à l'optimum social (Roland, 2000).

Les contrats incomplets et la contrainte budgétaire lâche

Si le gouvernement est bienveillant, il devient assez difficile d'expliquer pourquoi la propriété peut jouer. En effet, tout ce que la privatisation permet d'atteindre peut être dupliqué par un contrat adéquate passé avec l'entreprise publique. Cela est cependant vrai si les contrats sont complets. Il faut donc s'écarter de ce cadre d'analyse si on veut faire apparaître des arbitrages en faveur ou contre la privatisation.

Le point de départ des contrats incomplets est qu'il existe des états de la nature futurs que l'on ne peut pas imaginer. L'article fondateur est celui de Grossman et Hart (1986). Cependant, cet article ne traite pas des privatisations. Il cherche à savoir si un manager doit posséder les actifs avec lesquels il travaille ou s'il doit être employé. Cette approche a été adaptée à l'analyse des privatisations par Laffont et Tirole (1991), Schmidt (1996a,b) et Hart *et al.* (1997).

Les modèles de Schmidt (1996a,b) sont particulièrement intéressants car ils se réfèrent explicitement à la CBL. Ces deux travaux diffèrent cependant de l'article de Grossman et Hart (1986) où l'information est symétrique. Schmidt (1996a,b) suppose que la privatisation constitue un engagement de l'Etat à devenir incomplètement informé sur l'entreprise. En suivant la terminologie de Grossman et Hart (1986), Schmidt considère que l'accès à l'information sur les coûts de l'entreprise n'est pas un droit spécifique[16]. C'est un droit résiduel de contrôle qui est lié à la propriété[17].

Dans les deux modèles de Schmidt, un *manager* peut réaliser dans l'entreprise

[16] Un droit spécifique dans la littérature des contrats incomplets est un droit spécifié dans un contrat
[17] Celui qui est propriétaire est donc le seul à avoir ce droit.

des investissements non contractibles qui diminuent les coûts de l'entreprise et peuvent donner une rente potentielle d'information asymétrique. Avec la propriété publique, l'Etat est informé et exproprie les rentes. En conséquence, le *manager* qui anticipe ces expropriations ne réalise pas d'investissements et l'efficacité est faible. Si l'entreprise est privatisée, c'est un engagement de l'Etat à abandonner des rentes informationnelles au *manager*. Cela encourage les investissements non contractibles qui accroissent ses rentes. Il a donc une forte incitation à diminuer les coûts.

Les modèles de Schmidt expliquent donc pourquoi les coûts des entreprises publiques peuvent être plus élevés. C'est parce que les *managers* des entreprises publiques anticipent *ex-ante* qu'ils n'obtiendront aucun gain de leurs efforts additionnels pour diminuer les coûts que ces derniers sont élevés. Si ces coûts sont trop élevés, le gouvernement peut subventionner l'entreprise. On aura alors un phénomène de CBL. Si le gouvernement vend la firme au manager, il s'engage *ex-ante* à lui laisser une rente *ex-post*. Les coûts seront plus faibles, et la contrainte budgétaire aura durcie.

Ces modèles sont intéressants car ils expliquent pourquoi une entreprise publique peut avoir une contrainte budgétaire molle. En outre, et contrairement à Shleifer et Vishny (1994), les anticipations sont au coeur du modèle. Cependant, cela n'explique pas pourquoi, malgré de nombreuses privatisations, les phénomènes de CBL sont toujours présents dans les économies en transition (Kornai *et al.*, 2003). De plus, la contrainte budgétaire lâche est associée à des subventions dans les travaux de Schmidt. Mais les subventions ont largement été diminuées dans les économies en transition[18]. Dans de nombreux pays en transition, certaines firmes déficitaires ont continué à être sauvées *via* les crédits bancaires. Différents travaux empiriques le

[18] Certains pays font cependant exceptions. Nous pensons particulièrement à la Biélorussie, la Russie et l'Ukraine, où les subventions en pourcentage du PIB sont au moins trois fois plus élevées que dans les autres pays en transition (voir Roland, 2000, p.287 et le chapitre 4 de cette thèse pour des données plus récentes.)

confirment[19].

6.2.2 Crédit et contrainte budgétaire lâche

Le modèle de Dewatripont et Maskin (1995) a généré une importante littérature théorique qui n'associe pas forcément la CBL à la propriété des firmes. Dans ce cadre d'analyse, le phénomène de CBL apparaît quand une banque ne peut pas s'engager à limiter les sommes engagées dans une firme à celles prévues initialement. Quand la faible performance d'un projet déjà financé est avérée, il peut être optimal de refinancer ce projet car les fonds déjà engagés sont irrécouvrables. En raison d'une asymétrie informationnelle, la banque n'arrive pas à distinguer initialement entre les bons et les mauvais projets. La banque observe la qualité du projet seulement *ex-post*, c'est-à-dire une fois qu'une première somme d'argent à été investie dans l'entreprise. Refinancer l'entreprise peut alors être une stratégie qui soit pour la banque optimale *ex-post*. Néanmoins, si la banque avait su *ex-ante* que le projet était de mauvaise qualité, elle ne l'aurait jamais financé. Le manager de la firme connait la qualité du projet *ex-ante*. Il sait également si un mauvais projet sera refinancé. Si les mauvais projets ne sont pas refinancés (dans ce cas l'entreprise est liquidée), les bénéfices privés du *manager* sont négatifs. Cette hypothèse est justifiée par la perte de réputation du dirigeant. En revanche, si un mauvais projet est refinancé, les bénéfices privés de la firme sont positifs car elle survit. Ces deux hypothèses impliquent qu'un *manager* qui a un mauvais projet le soumettra à une banque si et seulement s'il anticipe d'être refinancé. L'incertitutde *ex-ante* est très importante dans ce genre de modèle. Si la banque avait pu *ex-ante* distinguer entre les bons et les

[19] On peut citer l'article de Brana *et al.* (1999) pour le cas russe, celui de Coricelli et Djankov (2001) pour la Roumanie, et les articles de Kornai (2001) et Schaffer (1998) qui traitent de plusieurs pays en transition. Si ces travaux utilisent des données des années 90, remarquons que le *Transition Report* de la BERD en 2006 signale que le problème persiste (voir par exemple le cas bulgare, p.102, et ouzbèque, p.194).

mauvais projets, elle n'aurait choisi que les bons projets. Nous obtenons un équilibre de CBL si la banque refinance les mauvais projets car, anticipant ce refinancement, les firmes qui ont des mauvais projets les soumettent.

Si la banque n'a aucun intérêt *ex-post* à refinancer les mauvais projets, nous avons un équilibre de contrainte budgétaire dure : les mauvais projets ne sont pas soumis car les managers savent qu'ils n'obtiendront pas d'extension de prêt en cas de problème ; seul les bons projets sont donc initialement financés. D'après Dewatripont et Maskin (1995), la CBL est donc principalement une question d'incohérence temporelle selon laquelle la banque ne peut pas s'engager de façon crédible sur le fait qu'elle n'interviendra pas afin d'aider financièrement les entreprises se trouvant en difficulté *ex-post*. A défaut d'un engagement crédible de la part de la banque à ne pas refinancer les mauvais projets, les entreprises prennent des décisions d'investissement *ex-ante* inefficaces. Ainsi la CBL n'existe pas dans une économie où l'information est symétrique et la structure incitative entre les agents est identique[20].

Dans l'article de Dewatripont et Maskin, le degré de centralisation du crédit peut expliquer pourquoi une banque est plus ou moins crédible à ne pas refinancer les mauvais projets. Un système bancaire est centralisé chez Dewatripont et Maskin si la banque a suffisamment de fonds pour refinancer le projet. Par contre si elle doit aller sur le marché interbancaire, le crédit est dit décentralisé. Dans une économie décentralisée, elle devra donc reverser une partie des gains finaux du mauvais projet à l'autre banque. Cela diminue son incitation à surveiller la firme et donc diminue la probabilité de refinancer les mauvais projets. La propriété de la banque peut également jouer. Si une banque est privée, on peut à juste titre penser qu'elle maximise son profit. En revanche, si la banque est publique, celle-ci est contrôlée par le gou-

[20] Plusieurs auteurs ont également montré comment le refinancement pouvaient générer les problèmes typiques des économies socialistes, en particulier la pénurie (Qian, 1994) et le manque d'innovation technologique (Qian et Xu, 1998).

vernement et ses objectifs sont ceux du gouvernement. Les théories de la CBL qui expliquent pourquoi une banque publique est plus amenée à refinancer les mauvais projets donnent donc des arguments soit de bien-être total (quand l'hypothèse d'un gouvernement bienveillant est faite) soit des arguments politiques. Si la liquidation d'un mauvais projet génère des externalités négatives très importantes sur le reste de l'économie, une banque publique refinancera le mauvais projet. On peut par exemple penser à un monopole qui a des difficultés financières. Si localement il est fournisseur de nombreuses entreprises, la liquidation pourrait entraîner de graves difficultés pour ces firmes. Dans le cas d'un monopsone local, la liquidation pourrait générer des problèmes de chômage. La banque publique, pour des raisons de bien-être global aura donc tendance à refinancer l'entreprise. Anticipant d'être aidés par l'Etat, ces monopoles et monopsones feront moins d'effort[21]. Le gouvernement peut également considérer que ces entreprises constituent un capital politique. Il y a par exemple des bénéfices politiques à garder des sureffectifs dans certaines entreprises. L'idée ici est assez proche de celle de Boycko *et al.* (1996) et Shleifer et Vishny (1994).

6.3 Contribution

Cette thèse contribue à la littérature résumée dans les sections 6.1 et 6.2.

Le chapitre 2 cherche tout d'abord à savoir si les privatisations ont eu un impact positif sur les performances macroéconomiques dans les économies en transition.

La transformation post-socialiste a donnée lieu à de nombreux travaux microéconométriques concernant la privatisation. La littérature empirique traitant de l'impact de la privatisation sur la restructuration des firmes a en général étudié les performances des firmes comme *proxy* de la restructuration. Par exemple, Fryd-

[21] Voir Segal (1998).

man *et al.* (1999) considèrent les recettes alors que Estrin et Rosevear (1999) se sont focalisés sur les ventes et les profits[22]. D'autres papiers ont utilisés des variables reflétant une prise de décision de restructuration. Par exemple, Djankov (1999) utilise comme variable de restructuration la rénovation des entreprises et Grosfeld et Nivet (1999) considèrent le taux d'investissement. Ces études, bien qu'intéressantes, ont néanmoins le défaut de ne jamais considérer les 25 pays d'Europe de l'Est en même temps. Par exemple, Estrin et Rosevear (1999) ne considèrent que l'Ukraine. La base de données de Grosfeld et Nivet (1999) ne concernent que des firmes Polonaises. Frydman *et al.* (1999) ont un échantillon qui ne concerne que trois pays : la Hongrie, la Pologne et la République Tchèque. Il y a deux raisons à cela (Djankov et Murrell, 2002). Tout d'abord, faire une même enquête dans de nombreux pays est coûteux. Ensuite, les données comptables ne sont pas forcément comparables d'un pays à l'autre, ce qui est très problématique lorsque l'on utilise des mesures de performances[23]. Zinnes *et al.* (2001) soulignent qu'une alternative pour compléter ces études microéconométriques est de considérer une étude macroéconométrique. De plus, le processus de privatisation est à concevoir à un niveau macroéconomique car il est à rapprocher de l'abandon d'une caractéristique institutionnelle impor-

[22] L'article de Frydman *et al.* est particulièrement cité dans la littérature car le travail fourni par ces auteurs pour contrôler pour de possible biais est considérable. Ils disposent d'un panel de 218 firmes (privatisées ou encore publiques) opérant en Hongrie, Pologne ou République Tchèque sur la période 1990-1993. Le fait d'avoir un panel de firmes dans plusieurs pays permet de prendre en compte les effets spécifiques années ainsi que les effets spécifiques pays. Pour montrer la robustesse de leurs résultats, les auteurs proposent également des estimations où ils contrôlent pour les caractéristiques des firmes invariantes dans le temps grâce à l'utilisation d'effets fixes firmes. Ils montrent que la privatisation à des *outsiders* a un impact positif important sur les recettes, contrairement aux ventes faites à des *insiders*.

[23] L'article de Carlin *et al.* (2001) est une exception. Ils considèrent les données d'une enquête réalisée par la BERD et la Banque Mondiale dans 25 pays d'Europe de l'Est. Leurs variables de restructurations sont la variation des ventes (en terme réel), la variation de l'emploi ainsi qu'une mesure de la qualité des produits. Cette dernière variable est construite à partir de réponse à plusieurs questions touchant l'amélioration des produits existants, l'introduction sur le marché de nouveaux produits, ou encore l'obtention de label ou certificat de qualité. Ils ne trouvent pas d'effet direct de la privatisation sur la croissance des ventes. Cependant, la privatisation a un effet positif sur l'amélioration des produits. L'amélioration des produits vendus augmente les ventes. Les auteurs concluent donc à un effet indirect de la propriété sur les ventes.

tante du socialisme réel : le monopole d'Etat des moyens de production. La plupart des économistes étaient d'accord pour dire que la privatisation aurait un large impact sur l'output, voire sur les taux de croissance des économies en transition. Or, si l'évolution des productions nationales a fait l'objet de plusieurs travaux macroéconométriques, ce sont essentiellement les impacts relatifs de la stabilisation macroéconomique, de la libéralisation et des conditions initiales sur les trajectoires de croissance qui ont été discutés[24]. Les indicateurs de privatisation de l'économie sont au mieux dilués dans un indicateur global de réformes comme celui de De Melo *et al.* (2001). En cohérence avec ces remarques, López et Sheshinski (2003) signalent qu'il n'y a aucune preuve macroéconométrique de l'impact positif des privatisations dans les économies en transition.

C'est d'ailleurs pour combler ce manque d'analyse macroéconomique que Zinnes *et al.* (2001) ont inclus un indicateur de privatisation de l'économie dans une fonction de croissance proche de celles estimées par ceux qui regardent l'impact de la stabilisation et de la libéralisation dans les économies en transition (De Melo *et al.*, 1996, 2001 ; Hernández-Catá, 1997). Leur base de données inclut 25 pays de l'Est sur la période 1990-1998[25]. Leurs résultats sont peu concluants: leur variable de privatisation n'est jamais significative, à moins d'intégrer dans leurs estimations une variable reflétant la dureté de la contrainte budgétaire et la qualité du cadre institutionnel permettant aux actionnaires de contrôler les managers. Ils concluent que la privatisation a un impact positif si et seulement si la contrainte budgétaire des firmes est suffisamment dure et qu'un cadre juridique où les actionnaires sont

[24] Les contributions importantes dans cette litérature sont Berg *et al.* (1999), De Melo *et al* (1996, 2001), Falcetti *et al.* (2002), Fischer *et al.* (1996a,b), Havrylyshyn *et al.* (1998) et Hernández-Catá (1997).

[25] Ces 25 pays sont l'Albanie, l'Arménie, L'Azerbaijan, la Biélorussie, la Bulgarie, la Croatie, la République tchèque, la Hongrie, l'Estonie, la Géorgie, le Kazakhstan, le Kyrgyztan, la Lithuanie, la Lettonie, la Macédonie, la Moldavie, la Pologne, la Roumanie, la Russie, la Slovaquie, la Slovénie, le Tajikistan, le Turkmenistan, l'Ukraine et l'Uzbekistan.

respectés existe. Alors que Zinnes *et al.* (2001) considèrent l'importance d'une contrainte budgétaire dure et du cadre institutionnel pour contrôler les managers, nous considérons les méthodes de privatisations mises en oeuvre dans les différents pays pour expliquer le fait que les privatisations n'ont statistiquement aucun impact.

En effet, si la privatisation a été présentée comme indispensable à l'efficacité économique au début du processus de transformation institutionnelle, il y avait cependant de profondes divergences sur la manière de privatiser. Le débat opposait les adeptes des privatisations de masse (par exemple Lipton et Sachs, 1990b; Boycko *et al.,* 1995) aux partisans de ventes graduelles (par exemple Kornai, 1990; Roland 2000).

Ce débat s'est traduit en pratique par des politiques de privatisation très différentes d'un pays à l'autre. Certains pays ont mis en place des stratégies de privatisation de masse à la population (comme la République tchèque) ou aux insiders (comme en Russie). D'autres ont favorisé des ventes graduelles à des investisseurs stratégiques, comme la Hongrie. Enfin, d'autres pays, comme la Slovénie, ont favorisé des ventes aux *insiders* (*Management Employee Buy Out*-MEBO-). Dix ans après *The Road to a Free Economy*[26] (1990), Kornai (2000) affirme qu'il avait raison. Il considère que les pays qui ont mis en place des stratégies de privatisation de masse ont eu des performances macroéconomiques moins bonnes que ceux qui ont mis en place des stratégies de ventes graduelles. Maintenant que suffisamment de temps s'est écoulé depuis le début de la transition, nous nous proposons d'examiner économétriquement si les affirmations de Kornai (2000) sont justes.

Nous montrons que la privatisation a un impact macroéconomique sur le PIB si et seulement si la méthode dominante de privatisation est la vente graduelle. Nous ne trouvons pas d'impact des privatisations si la méthode dominante est la privati-

[26] Cet ouvrage a été traduit en Français aux éditions Gallimard et s'intitule *Du Socialisme au Capitalisme*.

sation de masse. Par contre, nous ne trouvons pas de différence entre les différentes méthodes sur les taux de croissance annuels. Ces résultats diffèrent de résultats récents de Bennett *et al.* (2004a,b) qui trouvent que les pays ayant adopté des privatisations de masse ont des taux de croissance annuels plus élevés. Nous montrons que leurs résultats sont particulièrement sensibles au fait qu'ils ne contrôlent ni pour la stabilisation macroéconomique ni pour les autres réformes mises en place. D'autre part leurs résultats changent radicalement si on exclut les pays du Caucase (Arménie, Azerbaijan, Géorgie) de l'échantillon.

Nous trouvons donc que les ventes graduelles ont un plus grand impact sur le PIB mais qu'il n'y a pas de différence entre les différentes méthodes sur les taux de croissance.

Il est assez tentant de dire que l'échec des privatisations est dû au fait que les firmes privatisées par une telle méthode ont une contrainte budgétaire lâche. C'est du moins ce que semble indiquer une comparaison entre nos résultats et ceux de Zinnes *et al.*. Cependant, les travaux microéconométriques sur la CBL restent peu nombreux (Kornai *et al.*, 2003; Roland, 2000; Djankov et Murrel 2002). La plus grosse difficulté est de rendre opérationnelle la notion de mollesse. Dans la lignée des travaux de Kornai, Dewatripont, Maskin, Roland ou encore Qian, les anticipations des managers doivent être prises en compte. En effet, des entreprises peuvent être aidées par un gouvernement, mais on ne peut pas parler de contrainte molle si ces aides n'ont pas été anticipées par les *managers.* **Le chapitre 3** étudie empiriquement si les firmes qui ont obtenu un prêt bancaire anticipe d'avoir une extension en cas de difficultés financières. Ce travail est donc très proche du cadre d'analyse de Dewatripont et Maskin (1995) pour qui la CBL arrive lorsque une source de financement ne peut pas s'engager de manière crédible à limiter les sommes engagées dans une firme à celles prévues initialement. La base de données que nous

utilisons est le *Business Environment and Enterprirse Performance Survey* 2002 (BEEPS 2002), une enquête de plus de 6000 firmes dans 26 pays en transition réalisée par la BERD et la Banque Mondiale en 2002. A notre connaissance, seuls Anderson *et al.* (2000) avant nous avaient utilisé des données tirées d'une enquête "entreprises" demandant aux managers leurs anticipations d'une aide possible de l'Etat en cas de difficultés. Ils étudient les déterminants des anticipations des *managers* de recevoir une aide à partir d'un enquête de 246 firmes en Mongolie. La base de données BEEPS a donc l'avantage de concerner beaucoup plus de pays, et donc permet de contrôler pour des effets contextuels macroéconomiques. En outre, la question concerne des anticipations d'extension de prêt et est donc plus proche du cadre théorique de Dewatripont et Maskin. Nous montrons tout d'abord que les grandes firmes et les firmes qui ont réussi à obtenir un prêt sans collatéral anticipent plus facilement une extension en cas de difficultés. Concernant les formes de propriété, nous trouvons que les firmes possédées par des employés ont des anticipations plus grande de CBL dans les pays d'ex-URSS. Nous montrons ensuite que notre variable subjective d'anticipation reflète un important élément du phénomène de CBL. Nous trouvons que les firmes qui disent anticiper une CBL deviennent beaucoup moins réactives aux prix de leurs intrants que les autres firmes.

Le cadre d'analyse à la Dewatripont et Maskin est très intéressant. Il ne permet cependant pas de comprendre complètement pourquoi, en ex-URSS, les banques financent plus facilement les entreprises peu performantes. Si ces banques savent *ex-ante* quelles sont les mauvaises entreprises, cela pose la question de savoir pourquoi celles-ci trouvent plus facilement des prêts bancaires que les bonnes entreprises. Dans le modèle de Dewatripont et Maskin, la banque ne sait pas *ex-ante* la qualité de la firme. Si elle la connaissait, elle ne financerait pas les mauvaises firmes. Une possibilité est de dire que les banques sont publiques. Celles-ci financeraient donc

assez facilement ces mauvaises entreprises pour éviter un écroulement de la production dans certaines régions (voir la section 6.2.2). Cependant le nombre de banques privées est très important dans les économies d'ex-URSS, tout particulièrement en Russie où le nombre de banques était supérieur à 2000 avant la crise de 1998 (Huang *et al.*, 2004). Ce chiffre s'est depuis stabilisé à 1300, ce qui est toujours très élevé. Comment peut-on alors expliquer que des banques privées, qui par hypothèse maximisent leur profit, financent-elles des entreprises qui sont *ex-ante* non performantes et rechignent à financer les autres firmes.

Le **chapitre 4** explique que les problèmes de rationnement du crédit sont plus importants pour les bonnes firmes en raison du haut taux d'imposition sur les profits que doivent payer les entreprises dans la plupart des pays d'ex-URSS[27]. Plus précisément, nous argumentons que les banques ne prêtent qu'à certaines mauvaises entreprises qui sont aidées par le gouvernement qui joue le rôle de garant en dernier ressort.

Si dans le modèle de Dewatripont et Maskin la banque a un intérêt *ex-post* à refinancer un mauvais projet, le cadre d'analyse du chapitre 4 considère qu'il n'en est rien. C'est le gouvernement qui a un intérêt *ex-post* à refinancer certaines firmes. Les autres entreprises n'arrivent pas à trouver de liquidité car le taux de taxe est trop elévé. En effet, plus celui ci est élevé, moins les firmes font d'effort. Au delà d'un certain seuil, la probabilité d'obtenir un bon projet devient tellement faible qu'il n'est pas intéressant pour la banque de financer de telles entreprises. *Ceteris paribus*, les entreprises qui sont perpétuellement refinancées font moins d'efforts car elles anticipent des aides du gouvernement en cas de difficultés. Cependant, les banques anticipent également que le gouvernement viendra les aider en cas de difficultés

[27] Voir le tableau 4.1 p.109 de cette thèse qui fournit les taux d'imposition sur le profit qu'une firme typique doit payer en 2005. Ces données proviennent de la base de données *Doing Business* de la Banque Mondiale (2006a).

financières. Le fait d'avoir un garant facilite donc l'obtention d'un prêt.

Nous testons ensuite les méchanismes économiques du modèle à partir de l'enquête BEEPS 2005, réalisée par la BERD et la Banque Mondiale en 2005. Plus de 9000 firmes à travers 26 pays en transition y ont été enquêtées. Le taux d'imposition sur profit qu'une firme typique doit payer est extrait des données de *Doing Business* (Banque Mondiale, 2006a). Nous cherchons d'abord à savoir quelles firmes ont plus de chance d'obtenir des subventions en cas de difficultés financières. Ces firmes sont les entreprises publiques, les grandes firmes ainsi que les membres des *lobbies*. La probabilité estimée d'obtention de subventions, ainsi que le taux d'imposition typique qu'une firme doit payer, sont ensuite inclus dans un probit de sélection de prêts. Ces deux variables influencent la probabilité d'obtenir un prêt de la façon suivante : la probabilité d'obtenir des subventions influencent positivement la probabilité d'obtenir un prêt et le taux de taxe l'influence négativement. Ces résultats sont robustes à l'inclusion de nombreuses variables macro et microéconomiques.

Résumé Cette thèse contribue à la littérature sur les formes de propriété et la contrainte budgétaire lâche (CBL), sur la base des enseignements apportés par l'étude des pays d'Europe de l'Est. Nous cherchons tout d'abord à savoir si les privatisations ont eu un impact positif sur les performances macroéconomiques dans les économies en transition. Nous montrons que la privatisation a un impact positif sur le PIB si et seulement si les méthodes dominantes de privatisation mises en place sont des ventes graduelles. En revanche, la privatisation de l'économie par privatisation de masse n'a aucun impact sur le PIB. Une explication de ces résultats est que les schémas de privatisation de masse favorisent des phénomènes de CBL. Ils ont lieu lorsqu'une entreprise en difficultés financières est secourue par une institution (en particulier un gouvernement ou une banque). De plus, le syndrome n'est effectif que si les dirigeants anticipent que leur firme sera aidée en cas de difficultés financières, ces anticipations affectant ensuite les réactions de l'entreprise. Nous nous proposons alors d'étudier, dans un deuxième temps, quelles entreprises anticipent d'avoir une extension de prêt en cas de problèmes financiers, grâce à une enquête de plus de 5000 firmes. L'originalité de ce travail est d'utiliser des données subjectives d'anticipation comme la théorie le suggère. Les firmes dont l'obtention d'un prêt n'a pas nécessité de collatéral sont davantage amenées à anticiper une CBL, comme les grandes firmes et les firmes publiques vendues aux employés et managers en ex-URSS. Nous montrons également que notre variable subjective mesure une importante part de réalité car les firmes affirmant avoir une extension en cas de problèmes seront également moins réactives aux prix de leurs intrants, comme montré dans la littérature théorique. Le dernier chapitre propose un modèle théorique de CBL qui cherche à comprendre pourquoi, en ex-URSS, les entreprises perpétuellement non profitables trouvent plus facilement des prêts que les firmes profitables, et cela malgré un grand nombre de banques privées. Certaines firmes sont refinancées par des subventions de l'Etat. Anticipant d'être aidées en cas de difficultés financières, ces entreprises ne font pas d'effort. Cependant, cela a un très faible impact sur leur probabilité d'obtenir un prêt car le gouvernement joue le rôle de garant. En revanche, le prélèvement fiscal sur les bons projets des entreprises à contrainte budgétaire dure diminue leurs incitations à travailler. Si le taux de taxe est trop élevé, il devient impossible pour elles d'obtenir des prêts. Nous proposons ensuite une validation empirique de ces mécanismes. .

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