

# **Chapter 1**

## **The Theory of Privatization : A Literature Survey**

### **I. Introduction**

“Whither socialism?” is the broader question at hand, in the words of Joseph Stiglitz. This collection of paper originates from my interest in the reform efforts in transitional economies. More specifically, the surge of privatization in (former or current) socialist countries has spurred me to evaluate their privatization and nationalization policies from a new theoretical perspective. Given this background of my interests, one can find that my models are more applicable to centrally planned economies.

This dissertation consists of four chapters. This chapter will discuss several schools of thought that have contributed to our knowledge about privatization. Chapters 2 and 3 follow a microeconomic approach based on asymmetric information as a function of ownership structure and on the pertaining principal-agent theory. The last chapter deals with the consequences of public infrastructure investment on credit rationing and economic growth, with crowding out of the credit market for private investors versus endogenous growth effects.

Among all intellectual currents, the transaction cost and property rights school offers the farthest-reaching argument about ownership reform. This microeconomic approach will be presented in the section II of this chapter followed by an exposition of a competing microeconomic approach based on differences in objective functions between private and public firms. The relevance of principal-agent theory on privatization will be surveyed in the remainder of this section. Related macroeconomic implications of asymmetric information, especially the impact of credit rationing on economic growth, are addressed in section III. The entirety of my dissertation research will be outlined in section IV of this chapter.

## ***Ownership Structure and Principal-Agent Theory***

Why privatization becomes the subject of principal-agent theory is by no means a coincidence since the major question this theory attempts to address is how to avoid an agent's shirking behavior. That is exactly one of the objectives of privatization - to promote work incentives in public firms. The late 1980's have seen an outburst of incentive-theoretical literature, under the rubric of "mechanism design". Holmstrom (1979) derived a second best contract which characterized the trade-off of risk sharing and effort distortion between a risk neutral principal and a risk averse agent. In order to motivate an agent who can exert an unobservable effort, it is necessary to expose him to some risk at the expense of the sub-optimal risk sharing among these two parties. After Holmstrom, Baron & Myerson (1982) made the first attempt to model information imperfection in a regulatory framework. A principal was required to regulate an agent who has private knowledge about its production cost. The conclusion of their analysis is that if an audit is not implemented, the principal will grant the type of agent who can exploit his private information a rent to stop his cheating behavior. This efficiency versus rent trade-off has been proven robust in other extensions of the model. This strand of literature laid the foundation for applications of agency theory to privatization/nationalization questions to arise in the next decade.

Grossman and Hart's (1986) theory of "incomplete contracts" relates the discussion of ownership structure to the theory of costly contracting. In their pioneering paper, the ownership of a firm is defined as the acquisition of "residual rights of control". When some unanticipated situations occur, only the firm owner has the authority to implement any contingency plan. Such rights become critical when a contract is not complete in the sense that not all details of a transaction (or using Grossman & Hart's terminology, the specific rights of control) can be itemized and agreed upon by the parties involved. The incompleteness of contracts thus makes the discussion of ownership structures meaningful. This argument is indeed a remark on the Coase Theorem. To quote Cooter (1987), "...the initial allocation of legal entitlements does not matter from an efficiency perspective so long as the transaction costs of exchange are nil." However, when

contractual costs do exist, the allocation of property rights becomes essential for efficiency considerations. This leads me to model public and private firm as two different ownership structures. The government owns the residual right of the former and not of the latter. More to the point, the government is responsible for any distress happened to the public firm - but not for the latter.

The role of asymmetric information became an integral part of the discourse on privatization in 1987. The seminal contribution by Sappington and Stiglitz (1987) initiates the application of the theory of incentives to privatization issues. They argue that the main difference between private and public firms centers on the ease of government intervention to firms' production activities. Such an intervention is generally less costly in the public domain since the major barrier to intervention, the legal protection of private property, is absent in this case. Though the government can intervene in the public firm at a lower cost, its inability to commit to non-intervention or at least prudence still creates a harmful distortion of the behavior of the public firm. How can one resist the temptation of being a social planner ?

In Shapiro & Willig (1990) and Schmidt (1996a, 1996b), the government is assumed to be able to collect data about a public firm, whereas a private firm can observe a variable which cannot be verified by the government. Therefore, only in the former case principal (the government) and agent (the owner-manager) are symmetrically informed about a variable determined by the state of nature. This can be considered as a logical extension of the assumption of differing costs of intervention in the public and the private sectors.

In Shapiro and Willig (1990), two agency models with different layers of hierarchy for the private and public firms are developed and compared. Though the set-up is more complicated, the basic features of this paper are actually close to Sappington and Stiglitz (1987). The public firm is owned by a public official (called "Minister"), but run by a public manager on behalf of this firm-owner. All information about the public firm is shared between these two parties. The private firm model includes three players. On top of the hierarchy, an official is regulating a firm which is a private owner's property. The

owner supervises private managers who can observe some exclusive private information about the firm. One conclusion says that the effectiveness of private information will be null as long as it arrives after an investment decision. This “neutrality” theorem establishes the possibility of equivalence between the private and the public firm.

In Schmidt (1996a, 1996b), the government is interested in the cost and benefit of a nationalization/privatization policy. The government is well informed about a public firm but is unable to observe a technological factor and the manager’s effort level of a private firm. Privatization serves as a kind of commitment device of the government to harden the public firm’s soft budget constraint. By privatizing the firm, the government is committed not to subsidize the firm again. Schmidt’s main conclusion is hardly surprising : allocative efficiency is high but productive efficiency is poor under nationalization. On the other hand, allocative efficiency is lower while productive efficiency is higher under privatization due to a harder budget constraint.

Laffont and Tirole (1991) examined the privatization and incentive problem in a common agency framework. They argued that a change of ownership structure involves a tradeoff between two different kinds of cost, namely, the cost of private ownership and the cost of public ownership. The cost of private ownership stems from the fact that the manager needs to report to two different parties - the regulator and the group of shareholders. The conflict between these two principles creates too little incentive to induce effort from the manager. Although the manager does not encounter this problem in the public ownership case, he will not invest any effort since the government cannot commit to forego expropriation of the return of the manager’s investment – which would maximize the ex post public benefit of the investment. This is the so-called “cost of public ownership”. They arrive at the conclusion that, taken all effects together, it is difficult to tell the relative efficiency of the two ownership structures.

However, one may ask if the feature of common agency can identify the difference between private and public firms. A private firm can have a multitude of owners, hence many principals. *Prima facie*, the government is the single owner of the public firm. But

as is well recognized, one agent with several principals is also common in the public domain. There exist many different cliques, e.g. ministers, public servants, managers and board of directors trying to influence the operations of state-owned enterprises. These cliques sometimes cooperate but usually compete with each other. So, it is hard to identify one unified persona that manipulates the agent to pursue some well defined interests. Going to the other extreme, Aharoni (1982) describes a state-owned enterprise as an agent *without* a principal.

## **II. Alternative Approaches**

This section associates the information structure based approach to the privatization versus nationalization question to several other approaches which were only mentioned in the previous section.

### ***Transaction Cost School***

A clear determination of property rights is considered to be sufficient to any efficient market transaction by this school of thought. Given the ambiguous nature of public ownership, state-owned enterprises must be inefficient. Enterprises are owned by the state but who is representing the state is not always clear - the central government, the local government, the whole bureaucracy or the public ? Any one of them can have some say about the operations of state-owned enterprises. But when they run into financial distress, only the government will be responsible for the loss. The choice between private and public ownership thus boils down to a simple resolution - fully privatize all public firms. Proposed by some scholars holding similar points of view, another version of “iced turkey” scheme was almost implemented in mainland China. The underlying premise is that after property rights are formalized in the market, the invisible hand will automatically sweep all barriers on the road to optimality (See for example, Kornai 1992). Goods will go to people who need them most or who can put them into the most productive use. But this argument is valid only when the ownership right of a privatized firm can be allocated to a so-called real “economic man” who, according to classical economists like Adam Smith, is maximizing his own self-interest. As a matter of fact,

huge and industrialized firms are the real actors in the economy. The separation of ownership and control problem will thus ensue. Therefore, if the government ignores this potential pitfall, the privatization policy will merely transform the nature of agency problems but not amend them. For a more complete treatment of why the property rights approach may overlook this issue, one can read Steinfeld (1998).

So the relentless reality has yielded a shock to the advocates of unconditional privatization<sup>1</sup>. The reality is : the definition of private property rights can only provide an incomplete answer to the question. Without other coherent policies, e.g. price reform, a fair but competitive market environment, constitutional amendment, a stable political environment...etc., private property rights may not be sufficient for a successful reform at all. At the same time, people proposing “big bang” schemes always tend to ignore the time needed to build up a well-functioning market system. That good old adage seems still alive: “Rome was not built in a single day”.

### ***Structure of Objective Function***

This approach claims that the primary distinction of private and public firms hinges on their respective objective functions. To the extent that the owner of a private firm is only concerned with profitability, its objective is profit maximization. As a property of the government, the objective function of the public firm should subsume the interest of the public and the government officials. Consequently, it is a weighted sum of public and bureaucratic welfare. When private and public firms with different objectives are operating in the same market environment, several studies show that they may work equally well. But when political officials have more freedom to pursue their own objectives, the private firm performs better. If externalities are present, the public firm can dominate. (See Vickers and Yarrow, 1988)

A more complex question is how a change of market structure will affect the relative performance of private and public firms with different kinds of objective function, if they

---

<sup>1</sup> See Fisher (1994) for a brief account on the failure of privatization program in Eastern Europe.

interact in an imperfectly competitive market. The specific structures considered include oligopoly ( $M$  public firms,  $N$  private firms), duopoly (1 private firm and 1 public firm) and monopoly (1 public firm). The public firm may be the leader or the follower in a sort of Stackelberg game or the public and the private firms move simultaneously. In these studies of private and public sector interaction, various results have been obtained. See for example Cremer, Marchand & Thisse (1989). Depending on the market structure (the number of private and public firms in the market) and the amount of extra financial burden those public firms are responsible for (i.e. a wage premium per unit of output), the authors find arguments to support either privatization or nationalization policy. Interestingly enough, the private firm may not always be the one performing better. In a model developed by Fershtman (1990), a partly nationalized firm can earn a higher profit than a privatized firm in a duopolistic (Cournot) market. But note that strict assumptions, e.g. same cost functions and homogeneous products are imposed in the model. In addition, if we assume that the private and the public firms compete through price rather than quantities, the results can be reversed. Therefore, the effect of privatization on firm's profits is sensitive to which strategic variables firms are competing with.

The several schools of thought, especially Property Rights and Information Structure (Agency) approaches, are not as far apart as a first look might suggest. In Shapiro & Willig (1990), Schmidt (1996a, 1996b), transaction costs are one of the parameters to distinguish the private and the public firms. Sappington & Stiglitz (1987) articulate this clearly : “ ... What seems important to focus on, therefore, are the transactions costs associated with intervention. Direct government intervention into delegated production arrangements generally involves smaller costs under public provision than under private provision. ...” This makes the distinction between privately and publicly owned firms even more problematic. Now firms can be ranked along a spectrum according to their cost of intervention, with private firms located at one end of the spectrum and public firms located at the other. In between, there are various kinds of mixed enterprises with different costs of intervention. All in all, the microeconomic literature about privatization can be broadly divided into two strands—one concentrating on the agency structure inside firms, the other one analyzing the interaction of private and public institutions in

various markets. But people seldom consider the causal connection between the two. Should one treat the market behavior of a firm (public or private) as a function of its internal agency structure ?

### III. Macro Perspective

Besides ample contributions from microeconomics, there is some work on privatization by macroeconomic theorists. Boycko et al. (1996) suggest that public enterprises are inefficient because they are operated to pursue certain objectives, e.g. excess employment, to satisfy the political parties. After privatization, the cost for politicians to intervene in the firm in order to promote their personal goals become prohibitively high, because privatization drives a wedge between the manager and the politician. The politician may find it unprofitable to convince the manager *not* to undertake restructuring to maintain excessive employment. So privatization can render firms more efficient by controlling the politician's discretion. The bottom line of their paper is that the agency problems which the politician creates are more severe than those caused by public enterprises' managers.

One of the macro consequences of information asymmetry is credit rationing. In 1976, Rothschild and Stiglitz first studied a prototype of this problem in an insurance market. Their major finding is that the welfare properties of competitive market equilibrium vanish when there is asymmetric information between an insurance company and insurance buyers. Instead, when there are two different types (low risk and high risk) of buyers in the market, a separating equilibrium will exist. In the equilibrium, high risk buyers will be fully insured by the company but part of the low risk buyers will be rationed in that they remain uninsured. In 1981, the same authors investigated the same problem in the context of a credit market where the phenomenon of credit rationing problem is fully explored. Credit rationing arises because of information asymmetry between borrowers and lenders. Banks find it unprofitable to raise the interest rate to equate the supply of and demand for loans. In credit market equilibrium, some loan (low risk) applicants will not receive a loan even if they are willing to offer a higher interest

rate. An increase of interest rate will even change the mix of borrowers. To be concrete, most low risk borrowers will withdraw from the market whereas high risk borrowers who have strong proclivity to default ex post will stay. That will make it risky for the banks to set a high interest rate in order to increase their revenue. At the same time, otherwise low risk borrowers will be encouraged to take up high risk projects in order to obtain funds.

In the last 10 years, people have been investigating how credit rationing will affect the growth of an economy. The finding is almost unanimous - the credit rationing problem is hazardous to a country's growth. For example, Bencivenga & Smith (1993) find that credit rationing is detrimental to a country's economic growth since it may hinder the flow of resources from financial intermediaries to borrowers. Therefore, any government policy which accentuates credit rationing may also impair economic growth. Bose & Cothren (1996) are among the first to consider credit rationing and screening contracts in the same model. The financial intermediary is assumed to be able to offer two kinds of contract - credit rationing and screening in a credit market. Their conclusion shows that, depending on the magnitude of the screening cost, either one of these two contracts or a mix of them will be an equilibrium contract. Paradoxically, as the screening cost goes down, the economic growth rate will drop at the beginning. Only when the screening cost crosses a threshold value, a reduction of this cost can have a growth-enhancing result.

Recently, there have been some studies which cast doubt on the prevailing opinion that credit rationing impedes growth. Shi (1996) shows that credit rationing can have a favorable effect on economic growth. Lending a positive twist to an observation in Rothchild & Stiglitz (1981), he argues that a high interest rate motivates borrowers to undertake high risk projects whose success will usually result in higher payoffs and help foster the spillover effect of knowledge. His conclusion is that if the borrowers' switching cost from low risk to high risk projects is not extremely high and the high risk project can produce highly productive capital goods, then credit rationing will be growth-promoting.

To conclude, one may have to take into account several opposing effects, if one wants to assess the impact of credit rationing on a country's growth. How the story will be

changed if public and private enterprises coexist in a financial market with credit rationing is an intriguing question that has been barely addressed. An exception is Perotti (1993) who considers a credit market with both kinds of enterprises. But he focuses on explaining why banks have an incentive to fund former debtors (public enterprises) and not the more efficient private enterprises. Further issues of credit rationing are not examined. Nonetheless, this direction of research seems promising in view of its rich empirical implications. My third paper takes a step in yet another direction, credit rationing and performance of private investors in the presence of public infrastructure investment. The question is which effect dominates, crowding out of the credit market or endogenous growth.

#### **IV. Dissertation Summary**

In the first chapter of my dissertation, I try to highlight the agency problem which has been overlooked by the Property Rights/Transaction Cost school. Two models - one stands for a public firm and the other one stands for a private firm - are developed and compared. The analysis is based on an agency approach, assuming that the owner of a firm has cost information but also bears the cost of production. I find that the question which type of ownership, private or public, is superior does not have a clear cut answer. Private ownership may induce higher work effort but suffers from a discrepancy of private and social goals. While production distortion is less serious, an obvious disincentive to work exists in the public firm. This conclusion mirrors the claim that an unconditional privatization policy will transform the nature of the agency problem without necessarily resolving it.

In the second chapter, I examine how privatization policy can be considered as a threat to stimulate a public firm manager's work incentive when his effort level cannot be observed by the principal (the government). The term "privatization" has the implication that the firm will be responsible for the profit and loss of its investment decision after it is privatized. I find that the optimal privatization policy is a mixed strategy. Comparing to a benchmark model in which the privatization policy is not imposed, the manager's

effort is strictly higher under the threat of privatization. The role of wage and government investment subsidies as commitment devices to privatize is also studied. I prove that when the government cannot commit to privatize the public firm, both the wage and the investment subsidy are strictly greater than zero.

In the last chapter, I examine the role that public investment plays in a financial market with a credit rationing problem. Two kinds of borrowers co-exist in the economy, namely the public and the private. Both of them need funds to implement projects. But public borrowers can borrow money at a low interest rate and they are guaranteed enough funds to invest. Such assumptions are used to model a well recognized phenomenon in transition economies : public agencies enjoy a "first mover" advantage to borrow money from the government. In this situation, the credit rationing problem is found escalating. But since the success of a public project (owned by a public borrower) can exert positive externality on the productivity of other firms, the adverse effect induced by credit rationing can be alleviated. One conclusion of my paper shows that if the quality of the public projects is good enough, the economic growth rate can be higher than in the case without public projects in the economy.

## References

Aharoni, Yair. 1982. "State-owned Enterprise : An Agent without a Principal." In *Public Enterprise in Less-Developed Countries* (ed. Leroy P. Jones) Cambridge University Press, 67-76.

Baron, David P., and Myerson, Roger B. 1982. "Regulating a Monopoly with Unknown Costs." *Econometrica* 50, 911-30.

Bencivenga, Valerie, R., and Smith, Bruce, D. 1993. "Some Consequences of Credit Rationing in an Endogenous Growth Model." *Journal of Economic Dynamics and Control* 17, 97-122.

Bose, Niloy, and Cothren, Richard. 1996. "Equilibrium Loan Contracts and Endogenous Growth in the Presence of Asymmetric Information." *Journal of Monetary Economics* 38, 363-376.

Boycko, Maxim, Shleifer, Andrei, and Vishny, Robert, W. 1996. "A Theory of Privatization." *The Economic Journal* 106, 309-19.

- Cooter, Robert D., 1985. "Coase Theorem." In *The New Palgrave : A Dictionary of Economics* (ed. John Eatwell, Murray Milgate and Peter Newman) Stockton Press, New York 457-60.
- Cremer, H., Marchand, M. and Thisse J. F., 1989. "The Public Firm as an Instrument for Regulating an Oligopolistic Market." *Oxford Economic Papers* 41, 283-301.
- Fershtman C., 1990. "The Interdependence between Ownership Status and Market Structure : The Case of Privatization." *Economica* 57, 319-28.
- Fisher, Stanley. 1994. "Russia and the Soviet Union Then and Now." In *The Transition in Eastern Europe v.1 Country Studies* (ed. O. J. Blanchard, K. A. Froot and J. D. Sachs) The University of Chicago Press, Chicago 221-52.
- Grossman, Sanford, and Hart, Oliver. 1986. "The Costs and Benefits of Ownership : A Theory of Vertical and Lateral Integration." *Journal of Political Economy* 94, 691-719.
- Holmstrom, Bengt. 1979. "Moral Hazard and Observability." *The Bell Journal of Economics* 10, 74-91.
- Kornai, Janos. 1992. *The Socialist System : the Political Economy of Communism*. Princeton University Press, New Jersey.
- Laffont, J.-J., and Tirole, J. 1991. "Privatization and Incentives." *Journal of Law, Economics and Organization* 7, 84-105.
- Perotti, Enrico C., 1993. "Bank Lending in Transition Economies." *Journal of Banking and Finance* 17, 1021-32.
- Sappington, David E., and Stiglitz Joseph E. 1987. "Privatization, Information and Incentives." *Journal of Policy Analysis and Management* 6, 567-82.
- Schmidt, Klaus M. 1996a. "The Costs and Benefits of Privatization : An Incomplete Contracts Approach." *Journal of Law Economics and Organization* 12, 1-24.
- Schmidt, Klaus M. 1996b. "Incomplete Contracts and Privatization." *European Economic Review* 40, 569-79.
- Shapiro, Carl, and Willig, Robert D. 1990. "Economic Rationales for the Scope of Privatization." In *the Political Economy of Public Sector Reform and Privatization* (ed. E.N. Suleiman and J. Waterbury) Westview Press, London 55-87.
- Shi, Shouyong. 1996. "Asymmetric Information, Credit rationing, and Economic Growth." *Canadian Journal of Economics* XXIX, 665-687.
- Steinfeld, Edward S., 1998. *Forging Reform in China*. Cambridge University Press.
- Stiglitz, Joseph E., and Weiss, Andrew. 1981. "Credit Rationing in Markets with Imperfect Information." *American Economic Review* 71, 393-410.
- Vickers, John and Yarrow, George. 1988. *Privatization : An Economic Analysis*. MIT Press, Cambridge.