

# The Politician and his Banker\*

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## Abstract

How would a politician want to subsidize firms that create rents for himself? In a theoretical model with firms that differ in their credit worthiness, we compare different methods of subsidization: uninformed subsidization, information-based subsidization, public firms, and indirect subsidization through public banks. Laissez faire policy serves as a benchmark. We find that public banks are a cheaper mechanism than subsidization, because they avoid windfall gains to entrepreneurs, and they economize on screening costs. For the same reason, they welfare-dominate subsidies. However, public banks must not be allowed to fully compete with private banks, otherwise they waste tax money and hence lose their efficiency advantage.

**Keywords:** Public bank, subsidy, governance.

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# 1 Introduction

Public banks seem to be a mixed blessing. They can be used to cure market failures, but they can be (ab)used by politicians to pursue their own objectives (Sapienza, 2004). Currently, the latter view dominates the academic debates and policy decisions. In many countries, the size of the public banking sector has been reduced dramatically during the last decades. We have seen a wave of bank privatization, in particular in emerging markets (Megginson, 2005). In Europe, the framework in which public banks operate has changed: local governments are no longer allowed to grant guarantees for their public banks because the guarantee has been interpreted as a subsidy by the EU Commission.

However, a public bank is only one measure a politician can use to achieve his goals (such as undertaking projects that increase the probability that he is reelected). A public bank takes instructions from the politician, and in return receives a subsidy from the politician. Alternatively, he could, for example, grant subsidies, or own public firms. Given that public banks are not the only instrument at a politician's hand, what are the relative costs of different policy measures? Which instruments tend to lead to an over- or underprovision of funds? How do different policy measures influence social welfare? Can public banks possibly deliver the second-best allocation? To the best of our knowledge, there are neither theoretical nor empirical studies that compare a politician's different instruments and the costs of these different measures.

In order to answer these questions, we develop a theoretical model in which the projects yield a rent to the politician. The projects differ in their credit worthiness. Some are bankable, some are financed by a private bank only if they receive a subsidy, and others do not receive loans from banks even if they are subsidized. However, the politician does not know the credit worthiness of an individual project. This can only be found out by so-called credit specialists, who have access to a screening technology. Furthermore, we assume that the subsidization of projects requires taxation, which entails some distortion that bothers the politician.

We analyze and compare a number of different methods of subsidization. *First*, under laissez faire, which serves as a benchmark case, the politician completely abandons subsidization. *Second*, he can offer a subsidy to all firms that produce a rent. The drawback of this option is that the politician cannot keep bankable firms from taking the subsidy as a windfall gain. *Third*, the politician can employ a credit specialist at a public bank, and subsidize the bank. In this case, he must restrict competition for loans to firms with bankable projects, such that the public bank

does not serve this market. Otherwise, the public banker uses subsidies to capture market share from private banks. *Fourth*, the politician can employ credit specialists as consultants. Based on the resulting information, he can pick out and subsidize only those projects that need a subsidy to become bankable. However, the politician must respect the resulting incentive problems for the consultant (otherwise, the consultant may choose to gather too little information). *Finally*, the politician can create public firms. But this measure is quite costly for the politician as especially the worst entrepreneurs have an incentive to opt for public ownership.

Our analysis yields two important results. First, using a public bank can help a politician to allocate his subsidies efficiently. We show that subsidization in this case can implicitly be based on the public banker's information and, as a result, public banks work at a lower cost than external consultants. Second, we show that public banks dominate subsidization, and possibly other instruments, not only from the point of view of the politician but even with respect to social welfare. If the rent to the politician is welfare neutral, then laissez-faire maximizes welfare, and the politician should not intervene at all. If the projects also entail a positive social externality, then public banks can be welfare-optimal.

The paper is organized as follows: In section 2, we review the related literature. In section 3, we present the set-up of the model. We compare different institutions to subsidize projects (directly or indirectly) in section 4. In section 5, we compare these institutions from the politician's perspective, and from a social welfare perspective. In section 6, we discuss the results and derive some empirical predictions. We conclude in section 7.

## 2 Literature

Why should a public bank be different from a private bank? Differences might be due to the different objective functions of the owners, or their ability to solve incentive problems (Schnitzer, 2003). In general, the objective function of a state-owned firm might differ from the objective function of a private company that maximizes profits. Depending on the view on the state, the function a politician maximizes can be either social welfare, or his own objective function. Sapienza (2004) therefore contrasts the *social view* with the *political view*. According to the *social view*, state-owned banks are created as competitive markets may fail to achieve an efficient allocation, for instance, because the private and social returns of a project differ. Thus, a public bank can do better by internalizing the externality of the investment

project (Stiglitz, 1994).<sup>1</sup> According to the *political view*, public banks are the mere tools of self-interested politicians, used to extract rents. In Boycko, Shleifer, and Vishny (1996), for instance, the politician is interested in maximizing the probability of being re-elected.

The second difference between ownership structures is that ownership influences the costs of providing incentives to the management. It has often been argued that the state cannot commit to not refinance poorly performing state-owned firms. Therefore, they operate with a soft-budget constraint (Kornai, 1980).<sup>2</sup>

The *theoretical literature* shows that public banks can prevent capital drain from structurally weak regions if they operate on a *Regionalprinzip* (regional principle, see Hakenes and Schnabel, 2006). They also contribute to financial system stability by establishing firewalls against contagion and provide AAA assets (Allen and Gale, 2000). However, they themselves may suffer from a soft budget constraint and therefore face commitment problems vis-a-vis their debtors (see Gerard (2000) for a formal summary of the arguments).

In the *empirical literature* the perception of public banks and their activities is subject to considerable change. At least until the mid 1990s, the experience with directed lending in Japan and some other East Asian countries was quite positive. The Japan Development Bank (JDB) can serve as an example. Its purpose was to finance the modernization of the Japanese economy. The management of the JDB was politically independent and based its decisions on the professional judgement of its loan department. As a matter of fact, the JDB kept the level of loan losses much lower than the private financial sector (Vittas and Cho, 1995).

Moreover, evidence from Germany is favorable for the public banks. The public banks in Germany (Sparkassen) operate as efficiently as mutual banks (Genossenschaftsbanken), and both do slightly better than their private counterparts in terms of profit and cost efficiency (Altunbas, Evans, and Molyneux, 2001).<sup>3</sup> For the upper

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<sup>1</sup>Stiglitz lists the following market failures: monitoring as a public good, externalities (of monitoring, selection, and lending), externalities of financial disruption, missing or incomplete markets, imperfect competition, uninformed investors, and Pareto inefficiency in competitive markets.

<sup>2</sup>Using contract theory, this can be captured by the distribution of information which depends on who the owner is. If the state is the owner and can observe all important characteristics, a commitments problem arises (Schmidt, 1996).

<sup>3</sup>It is important to note that the authors exclude the banks of the upper levels of the multi-tier structures of the public and mutual banking sector. In particular, they exclude the DGZ Bank and the Landesbanken from the sample of public banks and the DG Bank and the five regional clearing houses from the sample of mutual banks. Landesbanken are the public banks of the Länder (states) within Germany. Their aim is to support the economic development within states, and to assist the local savings banks.

levels of the public banks, however, there is anecdotal evidence suggesting that they are used by the governments of the federal states to pursue their goals or even favor politically connected firms.

In emerging markets, depositors often face the problem that some private banks will not repay their deposits. In such circumstances, public banks are considered a safe haven by the depositors. The empirical analysis by Andrianova, Demetriades, and Shortland (2006) provides supporting evidence.

Most empirical papers support the political view and hence show the negative aspects of state-owned banks. Cross-country studies find that, in countries with higher government ownership of banks, both financial development and growth rates per capita are lower (La Porta, Lopez De Silanes, and Shleifer, 2002). In a sample containing both emerging markets and developed economies, Dinç (2005) shows that in election years state-owned banks increase their lending more than private banks. His finding is confirmed for India where agricultural credits by state-owned banks expand in election years. This is especially the case in districts in which the ruling party had a narrow margin of victory (or loss) in the previous election (Cole, 2006).

Khwaja and Mian (2005) use loan level data from Pakistan. They provide evidence that politically connected firms get larger loans than unconnected firms, pay lower interest rates and have higher default rates. These politically connected firms receive such favors exclusively from state-owned banks.<sup>4</sup> However, about 25 per cent of the loans from state-owned banks are granted by banks that explicitly have social objectives. Interestingly, these banks are not used to favor politically connected firms. The direct costs of politically connected lending are about 1.6 per cent of GDP per year. In addition, the deadweight loss from levying these transfer payments from the taxpayer are estimated to about 0.15–0.30 per cent of the annual GDP. The authors also point out the role of the democratic process in limiting the rents distributed: the rents decrease if electoral participation increases.

For Italy, Sapienza (2004) demonstrates that, controlling for borrower characteristics, state-owned banks charge lower interest rates than private banks. The difference between interest rates increases if the political support of the ruling party by the electorate increases. Moreover, state-owned banks favor larger firms and firms located in depressed areas. For France, Bertrand, Schoar, and Thesmar (2005) use the deregulation of the French banking sector starting in 1985 to elaborate on the negative effects of government intervention in the banking sector. After the reform, bank debt declined sharply, especially for poorly performing firms. Moreover,

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<sup>4</sup>It thus seems that politicians exercise influence on bank employees in order to grant favors to connected firms.

these poorly performing firms were more likely to exit. Overall, firm entry and exit fostered by banking deregulation drove the reallocation of resources.

The latter studies clearly indicate that politicians use public banks to pursue their own goals. None of the studies, however, compares the costs of granting subsidies through a public banks with other means of subsidization.

### 3 The Model

Consider an economy with four groups of agents: entrepreneurs, credit specialists, investors, and a politician. All agents are risk neutral, and there is no discounting.

There are three types of **entrepreneurs** of mass  $m_1$ ,  $m_2$  and  $m_3$ , with  $m_1 + m_2 + m_3 = 1$ . Each of them has a project that requires an investment of  $I$  and that leads to a return of  $Y$  with probability  $p_1$ ,  $p_2$  and  $p_3$  (depending on the type, stochastically independent, with  $p_1 > p_2 > p_3$ ), otherwise it returns 0. Hence, different projects have different degrees of creditworthiness; their probabilities of success differ. Since each entrepreneur has only one project, we use the expressions “project”, “entrepreneur” and “firm” interchangeably.

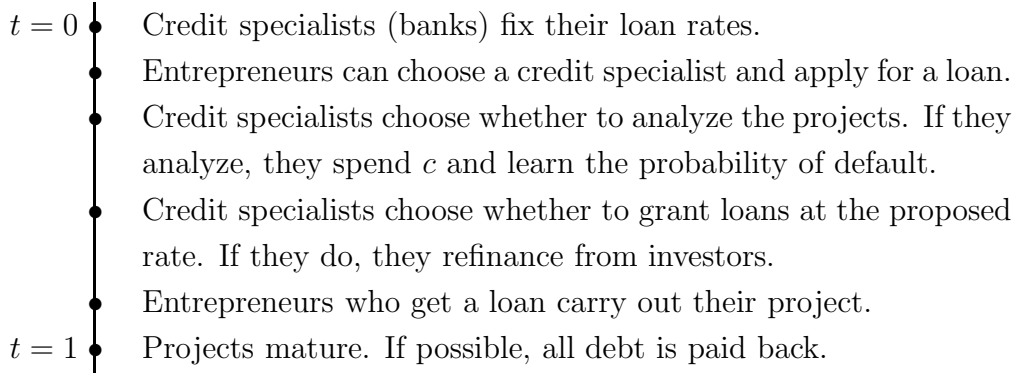
Type 1 projects are called *excellent*; type 2 projects are called *medium*; type 3 projects are called *bad*. We will give conditions on the success probability later in this section. Assume that only entrepreneurs know their own type; investors, credit specialists and politicians do not know the type of an entrepreneur. The distribution of project types is such that financing firms without conducting a creditworthiness test yields an expected loss for the creditor, i. e.,  $(m_1 p_1 + m_2 p_2 + m_3 p_3) Y < (m_1 + m_2 + m_3) I$ . Entrepreneurs do not have own funds; they must credit finance their projects. We assume that entrepreneurs will always apply for a loan, even if they anticipate that they will be rejected.

A finite number of **credit specialists** can carry out a credit analysis before granting a loan; they can spend an effort  $c$  to find out the success probability  $p$  of a project. The credit analysis is not observable. Due to our assumption that the average NPV of projects is negative, it is necessary to carry out a credit analysis before granting a loan.

A continuum of **investors** have unlimited funds, which they are willing to invest into projects, or deposit at banks, as long as their expected return is non-negative.

Successful projects lead to a positive rent  $X_{\text{Pol}}$  for the **politician**. For example, projects with a high  $X_{\text{Pol}}$  could be interpreted as projects that help the politician to

Figure 1: Time Structure



be reelected. In order to get the rent, the politician can subsidize projects. However, he does not know the creditworthiness/success probability of the individual projects. If he wants to spend money (for example to subsidize some projects), he must collect taxes. Like in Boycko, Shleifer, and Vishny (1996), let  $d_{\text{Pol}}$  be some disutility that the politician suffers from taxing his citizens. The politician wants to get the rent, but he still needs to economize on tax money. Hence, the politician's utility is  $X_{\text{Pol}}$  times the number of projects that are carried out minus the required taxation weighted by  $d_{\text{Pol}}$ .  $d_{\text{Pol}}$  can also be interpreted as the shadow price of spending tax money, if the politician has a fixed budget. With this way of modeling, the politician will try to implement as many projects as possible with a given amount of tax money, or he will try to implement a given number of projects using as little taxation as possible.

The projects can be ranked as follows: An excellent project has a success probability  $p_1$  high enough that the project is financed without the help of the politician, even if it needs to be screened,  $p_1 Y > I + c/m_1$ . A medium project has a negative NPV,  $p_2 Y < I$ , but the rent to the politician exceeds his disutility from subsidization,  $d_{\text{Pol}}(I - p_2 Y) < X_{\text{Pol}}$ . A bad project has a negative NPV, and not even the politician wants to subsidize it,  $d_{\text{Pol}}(I - p_3 Y) > X_{\text{Pol}}$ .

The time structure is given by Figure 1.

## 4 Institutions

In this section, we discuss different institutional arrangements that the politician may use to get the rent. We start with the laissez-faire as a point of reference. The institutions we study are arranged according to the degree of state intervention.

## 4.1 Laissez-faire

Consider the case where the politician does not intervene in the economy; he does not influence which projects are undertaken and therefore does not need to collect taxes. In our set-up, because the expected NPV of an investment without screening is negative, credit specialists must act as intermediaries between investors and entrepreneurs. Credit specialists run private banks: they take deposits at a rate  $r^D$ ; investors deposit funds at the banks; credit specialists screen projects; they grant loans to excellent entrepreneurs only (because bad and medium projects have a negative NPV); a loan is repaid if a project is successful; the credit specialist repays investors and keeps the surplus for himself. Hence, the credit specialist acts as a *banker*.

We denote the repayment to the bank by  $R^L$ . The banker must spend  $c$  to get the information necessary to decide which applicant is creditworthy. He grants a positive mass of loans (otherwise, his expected profits are zero); he is therefore well diversified because all repayments from entrepreneurs are stochastically independent. He never goes bankrupt and can always repay his liabilities to his depositors. As a consequence, he can set  $r^D = 1$ . Because the banker must borrow  $I$  per each loan that he grants, the repayment per loan is  $r^D I = I$ . The expected profit per loan of a banker who screens is given by

$$\Pi^{\text{Bank}} = m_1 (p_1 R^L - I) - c. \quad (1)$$

Investors cannot observe whether the banker screens or not, and screening is costly. Nevertheless, there is no delegation problem between investors and banker: the NPV of unscreened loans is negative by assumption, whereas the profit in (1) is nonnegative. We need to assume that  $m_1 (p_1 R^L - I) > c$ . If it were not, there would be no investment at all.

Excellent entrepreneurs want to get a loan rate  $R^L$  as low as possible. Hence, if different banks offer different loan rates, excellent entrepreneurs will all go to the bank which offers the lowest rates. As a consequence, other banks are left only with medium and bad entrepreneurs (which they reject), or with none at all. Thus, competition will drive down the bank's expected profits to zero; loan rates decrease until

$$R_1^L = \frac{I}{p_1} + \frac{c}{m_1 p_1}. \quad (2)$$

In equilibrium, excellent entrepreneurs get loans at rate  $R_1^L$ , whereas both bad and medium entrepreneurs apply for loans, but are rejected.<sup>5</sup>

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<sup>5</sup>It is also possible that screening costs are prohibitively high, such that the banker chooses not to grant loans at all, or investors choose not to deposit. We do not discuss these cases explicitly.

**The Politician's Utility** The politician's utility consists of the rent from excellent projects. As there is no taxation (and hence not distortion from taxation) under laissez faire, we have

$$U_{\text{Pol}}^{\text{LF}} = m_1 p_1 X_{\text{Pol}}. \quad (3)$$

## 4.2 Uninformed Subsidies

One way to guarantee that medium projects with externalities are carried out is to grant a direct subsidy. To subsidize firms, the politician must raise taxes. There are different times when the politician could grant the subsidy: before firms get loans from private banks, or afterwards. The later the politician grants the subsidy, the more information he can make the subsidy contingent on. For example, he could grant the subsidy only to firms who get loans, or only to successful firms (those who produce).

**Remark 1 (Uninformed Subsidy)** *As a subsidy, the politician grants a limited deficit guarantee to firms: he commits to a subsidy of*

$$S^{\text{US}} = \frac{I - p_2 Y}{1 - p_2} + \frac{(m_3 + m_2) c}{m_2 (1 - p_2)} \quad (4)$$

*to all firms that produce but are not successful.*

**Proof:** We show that the politician cannot improve upon the subsidy described in the remark, first arguing that the subsidy  $S^{\text{US}}$  of (4) is just high enough to help medium firms to produce. The necessary subsidy depends on the loan rates for different firms, so we have to determine these rates first. Banks make their interest rate offers contingent on the type of the entrepreneur. Suppose a private bank offers identical interest rates to all entrepreneurs. This bank would face (potential) competition from other banks that could commit to serving only excellent entrepreneurs. Bad entrepreneurs would not frequent these banks, because the probability to be rejected would be too high. As a consequence, these banks would have only excellent applicants, and hence could offer rather favorable rates. Their profits are driven down to zero, and are given by

$$\begin{aligned} \Pi_1^{\text{Bank}} &= m_1 (p_1 R_1^L + (1 - p_1) S^{\text{US}} - I) - m_1 c = 0, \\ R_1^L &= \frac{I + c - (1 - p_1) S^{\text{US}}}{p_1}. \end{aligned} \quad (5)$$

Because of this potential threat of competition, private banks cannot demand rates above  $R_1^L$  from their excellent entrepreneurs; excellent entrepreneurs only bear their own screening costs. This implies that the costs of screening out bad entrepreneurs must be borne entirely by medium entrepreneurs. Expected profits from lending to medium entrepreneurs are

$$\begin{aligned}\Pi_2^{\text{Bank}} &= m_2 (p_2 R_2^L + (1 - p_2) S^{\text{US}} - I) - (m_3 + m_2) c = 0, \\ R_2^L &= \frac{I + \frac{m_3 + m_2}{m_2} c - (1 - p_2) S^{\text{US}}}{p_2}.\end{aligned}$$

Competition between banks drives the bank's profits down to zero. Hence, medium entrepreneurs must pay higher loan rates than excellent entrepreneurs for two reasons. First, they must compensate bankers and investors for their higher probability of default. Second, they must bear the screening costs not only for themselves but also for bad entrepreneurs.

The politician wants to choose  $S^{\text{US}}$  just high enough that medium entrepreneurs participate. He knows that  $R_2^L$  depends negatively on  $S^{\text{US}}$ . Since he wants to minimize his subsidy payments, he takes into account that the highest repayment the bank can demand in the case of success is  $R_2^L = Y$ . That way, medium entrepreneurs are not allowed to keep any surplus, even if they are successful. Solving for  $S^{\text{US}}$ , we get (4). This kind of subsidy can be interpreted as a partial deficit guarantee by the government.

Now let us discuss the alternatives to this kind of subsidy. With a subsidy as in (4), both medium and excellent entrepreneurs will produce. With a subsidy *lower* than in (4), medium entrepreneurs could not produce, because the loan rate demanded by banks would exceed the maximum profit  $Y$ . As a consequence, production decisions would be the same as without any subsidy. With a subsidy slightly *higher* than (4), medium and excellent entrepreneurs would produce, but tax money would be wasted because the same production decisions could be achieved with a lower subsidy. With an even higher subsidy (for instance, an unlimited deficit guarantee that covers the total repayment), even bad entrepreneurs would get access to loans.

If the politician granted a subsidy unconditional on success, then the subsidy paid to excellent firms would be the same as that to medium firms. In the case of a partial deficit guarantee, the expected subsidy paid to excellent firms is lower because their probability of success is higher; that way, the politician can economize on tax money. If the politician granted a subsidy unconditional on production, then *all* firms would take the subsidy as a windfall gain. Even bad firms would take a subsidy although they cannot produce because they do not get access to private loans. This wastes tax money and creates a disutility to the politician. Summarizing, we find that

given the politician uses a subsidy to influence production decisions the method of remark 1 is the most efficient way of using tax money. ■

**The Politician's Utility** Both medium and excellent projects are carried out and take the subsidy. An aggregate tax of  $(m_2(1-p_2) + m_1(1-p_1))S$  must be raised to finance the subsidy. Hence, the politician's utility is

$$U_{\text{Pol}}^{\text{US}} = \sum_{i=2,1} (m_i p_i X_{\text{Pol}} - d_{\text{Pol}} m_i (1-p_i) S^{\text{US}}) \quad (6)$$

### 4.3 Public Banks

First of all, we must clarify what we mean with the notion of a “public bank.” Define a public bank as a bank that gets instructions from the politician, and in return receives a subsidy from the politician. It needs not necessarily be owned by the state. As a bank, it employs credit specialists (public bankers) in order to screen projects. In fact, we identify the credit specialist with the public bank. Public bankers are assumed to pursue their own interest, given the constraints created by the politician's instructions.

All instructions for the public banker need to be based on variables that are observable by the politician. For example, he can set a loan rate floor; public banks must then grant loans at rates that are below or above some threshold level, or below or above the rate of their private competitors. He *cannot* instruct bankers to grant loans only to medium entrepreneurs (the type of a project is not contractible).

**Remark 2 (Public bank)** *The politician will subsidize the public banks with*

$$S^{\text{PB}} = I - p_2 Y + \frac{m_3 + m_2}{m_2} c \quad (7)$$

*for each loan granted to a firm which generates a rent to the politician. Furthermore, he will restrict competition between the public and the private sector, e. g. by instructing the public bank to offer a loan rate above the private banks' equilibrium rate. If*

$$\frac{c}{Y} \geq \frac{m_3 m_2 (p_2 - p_3)}{(m_3 + m_2)^2}, \quad (8)$$

*the politician must control the public bank, e. g. by paying out the subsidy only if the default rate within the public bank's loan portfolio is not above  $1 - p_2$ .*

**Proof:** We proceed in four steps. First, we show that the above subsidy and instruction to the public bank suffices to get all medium projects financed. Second, we analyze the incentive problem of a public bank, and derive conditions for the optimal timing of the subsidy payment. Third, we explain why competition with private banks must be restricted. Fourth we show that, using the mechanism of a public bank, the politician cannot improve upon the institution described above.

First, we show that the subsidy of (7) is sufficiently high. Private banks compete with the public bank for excellent firms, but not for medium and bad firms. Because the public bank is not allowed to match an offer from a private bank, private banks will give loans only to excellent firms. Medium entrepreneurs will apply for a loan from the public bank. For bad entrepreneurs, we make the assumption that puts public banks to a disadvantage and assume that they also apply for a loan from the public bank. Consequently, excellent entrepreneurs need to bear only their own screening costs, and their loan rate will be  $R_1^L = (I + c)/p_1$ , just as in Section 4.5.

The public bank does not face any competition for medium entrepreneurs. Hence, it can demand a repayment of  $R_2^L = Y$  from its debtors. If the public bank serves only medium entrepreneurs, its profit function is given by

$$\Pi^{\text{PB}} = m_2(p_2 Y + S^{\text{PB}} - I) - (m_3 + m_2)c. \quad (9)$$

This term must be nonnegative, otherwise the public banker's participation constraint would be violated. Choosing  $S^{\text{PB}}$  as in (7), we find that the participation constraint just holds, the public banker's expected profits are zero.

Second, we analyze the banker's incentive problem. If a public banker grants loans without screening, he can save screening costs and still profit from the politician's subsidy. His expected profit is then

$$\Pi^{\text{PB}} = \sum_{i=3,2} m_i(p_i Y + S^{\text{PB}} - I) \quad (10)$$

If the profit in (9) is greater or equal to (10), then (8) holds and the banker has an incentive to screen, even without controlling the politician any further. The subsidy  $S^{\text{PB}}$  contains an indirect subsidy to medium firms, and a remuneration for the banker's screening effort. If  $c$  is relatively high, the banker gets a high remuneration; this is sufficient to create incentive compatibility.

If (8) fails to hold, the public banker does not have sufficient incentives to screen. The politician needs to take a more active role in "controlling" the bank. Because the expected rate of default of an unscreened loan is above  $1 - p_2$ , one possibility is to pay out the subsidy only after the realized default rate does not exceed  $1 - p_2$ .

If it does, the politician knows that the public banker has not screened all loans, and he needs to punish the public banker. One way would be to cut the subsidy, another (in another, multi-period model) might be to sack the banker. In any case, if (8) fails to hold, then the politician needs a tighter control over the bank.

Third, an important feature of the public bank is that competition with private banks must be restricted, for example, by not allowing public banks to offer the same loan rates as private banks. If there were unrestricted competition, the public bank could give loans to excellent entrepreneurs and still collect the subsidy. This would allow them to make positive profits. Consequently, public banks would grant loans to all excellent and medium entrepreneurs. The aggregate subsidy to the public bank would then be higher than with direct subsidization of firms, as in Section 4.2.

Fourth, let us explain why the politician cannot improve upon the institution described in the remark. Of course, the subsidy must not be higher than necessary to satisfy the public bankers' participation and incentive compatibility constraints; otherwise, tax money would be wasted. The participation constraint is just binding if (7) holds. If (8) fails to hold, incentives to screen can be provided by paying out the subsidies after the loans are repaid. ■

How independent is the public bank from the politician? It does not belong to the politician in the sense that the politician can claim the public bank's profits. The public banker must keep the profits for himself, otherwise he would not have any incentives to screen. Still, the politician must be able to give the public bank instructions. Hence, the politician is authorized, but he is not the residual claimant of the public bank. Especially if (8) does not hold, the politician needs some right to punish the public banker, e. g. to cut the subsidy, or to sack the banker.

**The Politician's Utility** By using the screening skills of the public bank, the politician limits the (indirect) subsidies to medium entrepreneurs. As a consequence, the politician's utility moves to

$$U_{\text{Pol}}^{\text{PB}} = \sum_{i=2,1} m_i p_i X_{\text{Pol}} - d_{\text{Pol}} m_2 S^{\text{PB}}. \quad (11)$$

How does the possibility of granting a subsidy through a public bank influence the politician's utility?

**Proposition 1** *The politician prefers public banks to uninformed subsidies because  $U_{\text{Pol}}^{\text{PB}} > U_{\text{Pol}}^{\text{US}}$ .*

**Proof:** Comparing the politician's utilities of the two institutional settings,

$$U_{\text{Pol}}^{\text{US}} < U_{\text{Pol}}^{\text{PB}} \iff 0 < d_{\text{Pol}} \frac{m_1 (1 - p_1) (m_2 (I - p_2 Y) + c (m_3 + m_2))}{m_2 (1 - p_2)}.$$

This is true because  $I > p_2 Y$ . ■

Having a public bank, the politician's utility is higher than with an uninformed subsidy. The intuition is as follows. Public banks have to be paid from the politician not only for the indirect subsidies that they give, but also for the screening that they provide. The indirect subsidies are always lower than the uninformed subsidies, because excellent firms do not take any windfall gains. But what about the screening costs? Under the uninformed subsidy regime, the costs of screening out bad projects are entirely borne by medium entrepreneurs, hence the politician has to pay these costs indirectly through the subsidy. Hence the distribution of screening costs are the same in both regimes,  $m_3 c$  is paid by excellent entrepreneurs, and  $(m_1 + m_2) c$  is paid from tax money.

#### 4.4 Informed Subsidies

There is an obvious alternative to public banks in which the politician does not directly interfere in the financial system, but still uses the information that credit specialists can gather. The politician can employ credit specialists for consulting. Hence, the politician delegates the assessment of the credit worthiness to a credit specialist. He can then give a subsidy only to medium firms, based on the information. In this section, we will analyze how the politician can optimally get the information from his consultant. We will, however, show that the politician prefers public banks to information-based subsidies.

**Remark 3 (Informed Subsidies)** *The politician seeks advice from consultants before subsidizing. Before entrepreneurs apply for loans at private banks, he grants the subsidy of*

$$S^{\text{IS}} = I - p_2 Y. \tag{12}$$

*to medium entrepreneurs.*

**Proof:** First, we explain why the politician gives the subsidy before entrepreneurs apply for loans. If he waited, he would have a commitment problem. After entrepreneurs already have a loan, their projects are sufficiently financed and carried out,

hence the politician would have an incentive not to give a subsidy. Banks would anticipate this behavior and would not grant loans to medium entrepreneurs in the first place. The politician cannot commit to subsidizing medium entrepreneurs only, because the type of an entrepreneur is not directly observable.

In order to analyze the size of the subsidy, we need to find out which entrepreneurs are screened by whom. All entrepreneurs will apply for the subsidy, so the aggregate screening cost of the consultants is at least  $c$ . It is also possible to find a contract that needs no more than  $c$ : Employ one consultant and let him screen all entrepreneurs, employ another consultant and let him control a random fraction  $\varepsilon$ , pay the first consultant only if the second finds no mistakes, and let  $\varepsilon$  converge to zero. Based on the first consultant's report, the politician grants subsidies only to medium entrepreneurs. Now private banks can observe the subsidy, and hence can give loans without further screening to these subsidized entrepreneurs (if the subsidy is sufficiently high). Hence, the profit of a private bank from a subsidized (medium) entrepreneur is

$$\Pi_2^{\text{Bank}} = m_2 (p_2 R_2^L + (1 - p_2) S^{\text{IS}} - I),$$

hence under perfect competition, the loan rate will be

$$R_2^L = \frac{I - (1 - p_2) S^{\text{IS}}}{p_2}.$$

The politician can again set the subsidy such that the medium entrepreneurs' participation constraint binds. Setting  $R_2^L = Y + S$ , we get  $S^{\text{IS}} = I - p_2 Y$ . Now after medium entrepreneurs have got a subsidy and a loan, both excellent and bad entrepreneurs will apply for loans at private banks, and be screened by these banks. As a consequence, the profit function from a non-subsidized loan is

$$\Pi_1^{\text{Bank}} = m_1 (p_1 R_1^L - I) - (m_3 + m_1) c,$$

hence in market equilibrium the interest rate is

$$R_1^L = \frac{(m_3 + m_1) c + m_1 I}{m_1 p_1}.$$

In equilibrium, the excellent firms have to bear the screening costs for excellent and bad firms. One may wonder why, as opposed to controlling a public bank, making the consultant's wage dependent on the realized default rate does not solve the incentive problem here. Instead, a two-tier hierarchy is necessary. The reason is that, if the politician paid the wage only if the default rate of subsidized firms was  $1 - p_2$ , the consultant could still blend in unscreened loans (with an average success probability of  $m_1 p_1 + m_2 p_2 + m_3 p_3 < p_2$ ), leveling out with some excellent firms

(with probability of success of  $p_1 > p_2$ ). For each unscreened firm, the consultant must take  $(m_1 p_1 - (1 - m_2) p_2 + m_3 p_3)/(p_2 - p_3)$  excellent firms into the pool of subsidized firms; the average default rate will then be exactly  $1 - p_2$ . Hence, the politician needs to be consulted by at least two credit specialists.

The public consultants cannot be the owners of private banks, but must be independent agents. The politician cannot allow his public consultant to give loans to entrepreneurs that get a subsidy: The public consultant would have – in terms of information – a competitive advantage on the loan market in comparison to other private banks. Therefore, he could always offer a lower loan rate than the private bank and make sure that he can grant the loan. Anticipating this, the public consultant could tell the politician to subsidize, even if an entrepreneur is already excellent. The public consultant could profit indirectly because of his competitive advantage. As a consequence, both excellent and medium firms would get the subsidy, and the consultant's advice would be worthless. Moreover, if the public consultant gave the loan himself, the institutional setting might be indistinguishably close to a public bank. ■

**The Politician's Utility** The politician must pay  $c$  to the team of consultants and  $S^{\text{IS}}$  to medium entrepreneurs. Hence, his expected utility amounts to

$$U_{\text{Pol}}^{\text{IS}} = \sum_{i=2,1} m_i X_{\text{Pol}} - d_{\text{Pol}} m_2 S^{\text{IS}} - d_{\text{Pol}} c. \quad (13)$$

How does having a consultant influence the politician's utility relative to having a public bank?

**Proposition 2** *The politician prefers public banks to informed subsidies because  $U_{\text{Pol}}^{\text{PB}} > U_{\text{Pol}}^{\text{IS}}$ .*

**Proof:** In analogy to the proof of Proposition 1,

$$U_{\text{Pol}}^{\text{IS}} < U_{\text{Pol}}^{\text{PB}} \iff 0 < c d_{\text{Pol}} (1 - m_3 - m_2),$$

which is true for strictly positive  $c$  and  $d_{\text{Pol}}$ . ■

This utility is smaller than that from public banks, the reason being that expected screening costs are higher with the informed subsidy and the politician has to reimburse the public consultant for the screening costs. All firms want a subsidy, hence all firms apply and need to be screened. Only medium and bad firms prefer a public loan to a private loan, hence excellent firms do not need to be screened out; less tax money is paid on screening.

## 4.5 Public Firms

In many cases, politicians have projects carried out simply by public firms. Within our framework, one could allow the politician to create his own firm. However, because he does not have the ability to carry out projects, he would need to employ entrepreneurs. To employ them, he needs to offer them a wage. The politician can choose to have large public firms with a continuum of entrepreneurs (such that the law of large number applies within a firm), or to have many small firms (such that the law of large number applies between firms). Both cases lead to identical allocations, hence we consider only the first case. Also, note that the politician does not need to pay the complete investment of public firms with tax money. He can take a loan from investors, and guarantee the repayment. That way, credit specialists (private banks) are not even needed as intermediaries between investors and public firms. Loans from public firms are like treasury bonds; they do not need to be screened and can directly be traded on the capital markets. We have the following remark.

**Remark 4 (Public Firms)** *In a public firm, medium entrepreneurs automatically entail the employment of bad entrepreneurs. The aggregate tax burden from the guarantee for the public firm is*

$$S^{\text{PF}} = \sum_{i=2,3} m_i (I - p_i Y). \quad (14)$$

**Proof:** When making wage offers, the politician needs to take into account the outside option that different types of entrepreneurs have. Medium entrepreneurs have expected profits of zero if they do not sell their project because they cannot get loans from private banks. Consequently, the politician does not need to offer more than an infinitesimal wage to employ medium entrepreneurs. In the limiting case, he can pay a wage of zero. However, at this wage, bad entrepreneurs will apply as well. Only excellent entrepreneurs will choose to remain independent at a zero wage. However, the politician does not aim to employ excellent entrepreneurs in the first place – excellent projects are carried out without government intervention, because excellent entrepreneurs are financed by private banks.

Although the politician does not need to pay for the projects, public firms do not come free of cost. The politician needs to be liable for the debt of public firms; otherwise, investors would not grant loans. Because investors can observe that the government guarantees the repayment, they do not need to screen public firms. They get the same repayment in the case of success and failure, independent of the quality of the entrepreneurs within the firm. Therefore, they do not need a compensation for risk, and every public firm has a loan rate of  $r^L = 1$ .

Hence, the politician's expected payment for such bail-outs is  $(m_3(1-p_3) + m_2(1-p_2))I$ . However, the politician does not need to finance these payments completely from taxes. He can use the revenues from the successful public firms, which amount to  $(m_3p_3 + m_2p_2)(Y - I)$ . Only the difference between the expected revenues and the expected bail-outs must be levied by taxation,

$$S^{\text{PF}} = \sum_{i=3,2} m_i(1-p_i)I - m_i p_i(Y - I),$$

which is equal to (14). As private banks can observe which firms are public, they need to screen only those who are not public, i.e., the excellent (private) firms. Even if all applicants are excellent in equilibrium, banks must still screen, because otherwise the bad and medium entrepreneurs would strategically reject the offer to become public, and instead apply for a loan which they would get with certainty. Still, in equilibrium, all the firms that are screened are excellent. Hence excellent entrepreneurs need to bear only their own screening costs, and  $R_1^L = (I + c)/p_1$ . This is higher than (5) because excellent firms cannot profit from any subsidy in the case of nationalization. ■

**The Politician's Utility** All projects are carried out; the politician's utility is

$$U_{\text{Pol}}^{\text{PF}} = \sum_{i=1,2,3} m_i p_i X_{\text{Pol}} - d_{\text{Pol}} S^{\text{PF}} \quad (15)$$

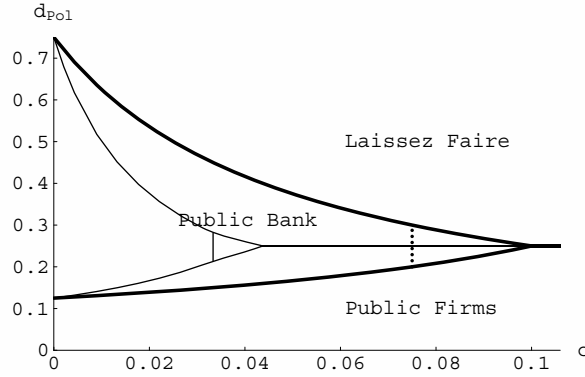
## 5 Comparison of Institutions

### 5.1 The Politician's Choice

Let us discuss which of the institutions the politician chooses under differing parameter constellations, hence which of the institutions yields the highest utility  $U_{\text{Pol}}$ . For an illustration, we have fixed parameters at  $I = 1.0$ ,  $Y = 1.2$ ,  $p_1 = 1.0$ ,  $p_2 = 0.6$ ,  $p_3 = 0.5$ ,  $m_1 = m_2 = m_3 = 1/3$ , and  $X_{\text{Pol}} = 0.1$  and plotted the optimal institution from the viewpoint of the politician in Figure 2. Bold curves mark the borders between optimal institutions. Within the regime with public banks, the dashed bold line marks the border to the right of which the politician needs to control his public bank, or needs to induce some nontrivial organization. As stated by the above propositions, uninformed and informed subsidies are dominated by public banks.

However, if for some reason public banks were not an option, the politician might pick one of the other two types of subsidization. This is marked by the thin curves.

Figure 2: Institutions under the Political View



The politician will choose laissez faire and public firms in even larger parameter regions. For small  $c$ , he might choose the informed subsidy (between the thin curves), whereas for larger  $c$  (in the little triangle), he will choose an uninformed subsidy.

Clearly, the institution that the politician picks still depends on the parameters  $c$  and  $d_{Pol}$ . For relatively high  $d_{Pol}$ , the costs of intervention are so high that the politician prefers not to interfere at all (laissez faire). For relatively low  $d_{Pol}$ , the politician prefers to have all projects financed and hence uses public firms to carry out projects. That way, he benefits from the rent  $X_{Pol}$  of all projects, even of the bad firms. Again, note that the politician will never have an incentive to make excellent firms public under the political view. For medium  $d_{Pol}$  and not too large  $c$ , the politician will choose to subsidize firms. In this range, the politician prefers subsidization to public firms because his costs of taxation  $d_{Pol}$  are relatively high. This disadvantage is high enough to compensate the politician for giving up the rent of bad projects, which are not undertaken under subsidization. The politician prefers subsidization to laissez faire because the costs of raising taxes are low enough to justify the realization of medium projects which would not be undertaken in the laissez faire case.

Note that the qualitative features of Figure 2 are general: The regime border between public firms and laissez faire is a horizontal line, because neither  $U_{Pol}^{PF}$  nor  $U_{Pol}^{LF}$  depend on  $c$ . For  $d_{Pol} = 0$ , the politician always prefers to have public firms, because that way all projects are carried out and yield the rent for the politician, but he does not suffer any disutility. For  $c = 0$  and intermediate costs of taxation it is optimal for the politician to subsidize firms (using public banks) instead of making them public. Here, the cost advantage of public banks is relatively large as the subsidy does not have to cover any screening costs and thus exceeds the political rent from bad projects. As  $d_{Pol}$  exceeds a threshold value, laissez faire is chosen as the costs of

a subsidy become too high relative to the additional rent that medium entrepreneurs create.

## 5.2 Social Welfare

In this section, we compute social welfare in the five different institutional settings. But up to now, we have assumed that projects lead to an externality on the politician (rent  $X_{\text{Pol}}$ ), but not on the public. For the welfare analysis, let us assume that a successful projects also has an externality  $X_{\text{Soc}}$  on the public. Potentially,  $X_{\text{Soc}} = 0$ ; then the project's success does not have any net externalities, the positive externalities to the politician are evened out by negative externalities to the public; successful projects just redistribute rents. For  $X_{\text{Soc}} > 0$ , not only the politician but also the public profits from a successful project. For  $X_{\text{Soc}} < 0$ , the project has even a negative effect on public welfare. Furthermore, we assume that taxation leads to a social distortion that is proportional to the tax,  $d_{\text{Soc}}$ . Note that even for  $X_{\text{Pol}} = X_{\text{Soc}}$  and  $d_{\text{Pol}} = d_{\text{Soc}}$ , the politician does not always pick the welfare-optimal institution. Social welfare takes into account profits and losses of third parties (e.g., private banks or entrepreneurs), the politician's utility function does not.

**Laissez Faire** Aggregate welfare under the social view consists of the net present value of excellent projects including the externality, weighted by the mass of excellent entrepreneurs, net of the costs of screening, and can be written as

$$W_{\text{Soc}}^{\text{LF}} = m_1 (p_1 (Y + X_{\text{Soc}}) - I) - c. \quad (16)$$

The politician could be better off if also medium projects were financed. However, under laissez faire, medium entrepreneurs are turned down by bankers and the positive externalities of their projects are not realized.

**Uninformed Subsidies** Using a partial guarantee allows the politician to realize the externalities of excellent and medium projects.

$$W_{\text{Soc}}^{\text{US}} = \sum_{i=2,1} m_i (p_i (Y + X_{\text{Soc}}) - I) - d_{\text{Soc}} m_i (1 - p_i) S^{\text{US}} - c. \quad (17)$$

However, he must subsidize not only medium projects, but also excellent projects that would be undertaken even without any subsidies. Thus, the social price of realizing more externalities (in comparison to the laissez faire case) are higher tax distortions.

**Public Banks** Using a public bank allows the politician to realize the externalities of excellent and medium projects. However, the costs of subsidization differ and, thus, welfare moves to

$$W_{\text{Soc}}^{\text{PB}} = \sum_{i=2,1} m_i (p_i (Y + X_{\text{Soc}}) - I) - d_{\text{Soc}} m_2 S^{\text{PB}} - c. \quad (18)$$

**Informed Subsidies** All entrepreneurs are screened by the public consultant, who is paid from tax money, leading to social costs of  $(1 + d_{\text{Soc}}) c$ . Medium entrepreneurs get the subsidy, entailing social costs of  $d_{\text{Soc}} m_2 S^{\text{IS}}$ . Bad and excellent entrepreneurs are screened by private bankers, leading to social costs of  $(m_3 + m_1) c$ . Medium and excellent projects are carried out and lead to a welfare gain. Hence, aggregate welfare is

$$\begin{aligned} W_{\text{Soc}}^{\text{IS}} &= \sum_{i=1,2} m_i (p_i (Y + X_{\text{Soc}}) - I) - d_{\text{Soc}} m_2 S^{\text{IS}} \\ &\quad - (m_1 + m_3) c - (1 + d_{\text{Soc}}) c. \end{aligned} \quad (19)$$

**Public Firms** All projects are carried out and the net losses of the public firms are covered by the politician. As only excellent entrepreneurs are screened in equilibrium, aggregate welfare is

$$W_{\text{Soc}}^{\text{PF}} = \sum_{i=1,2,3} m_i (p_i (Y + X_{\text{Soc}}) - I) - d_{\text{Soc}} S^{\text{PF}} - m_1 c. \quad (20)$$

In the case of public firms, the cost of realizing more externalities in comparison to the laissez faire case is that bad projects are financed as well. These projects should not be carried out from a social perspective because their NPV is negative.

**Proposition 3** *The institution of a public bank welfare-dominates both uninformed and informed subsidies since  $W_{\text{Soc}}^{\text{PB}} > W_{\text{Soc}}^{\text{US}}$  and  $W_{\text{Soc}}^{\text{PB}} > W_{\text{Soc}}^{\text{IS}}$ .*

**Proof:** Comparing social welfare in different institutions,

$$\begin{aligned} W_{\text{Soc}}^{\text{US}} < W_{\text{Soc}}^{\text{PB}} &\iff \\ 0 < d_{\text{Soc}} &\frac{m_1 (1 - p_1) (m_2 (1 - p_2) Y) + c (m_3 + m_2)}{m_2 (1 - p_2)}, \end{aligned}$$

which is true because  $I > p_2 Y$ . Along the same line,

$$\begin{aligned} W_{\text{Soc}}^{\text{IS}} < W_{\text{Soc}}^{\text{PB}} &\iff \\ 0 < c (m_3 + m_1 + d_{\text{Soc}} (1 - m_3 - m_2)), \end{aligned}$$

which is true. This completes the proof. ■

Like with a politician that maximizes his own utility, and for similar reasons, the public bank dominates informed and uninformed subsidies. In comparison to the informed subsidy, the politician can economize on screening costs through a public bank by avoiding the double screening by private banks and public consultants. If  $X_{\text{Soc}}$  is not too small, a public bank can even welfare-dominate the laissez-faire regime. However, if  $X_{\text{Soc}}$  is small, zero, or even negative, then laissez-faire is the optimal policy. This is obvious from comparing the welfare of the different regimes.

Summing up, this section has made three points. *First*, and almost trivially so, laissez-faire is the first-best alternative if the social externality of projects is negative,  $X_{\text{Soc}} \leq 0$ . *Second*, public banks welfare-dominate both the informed and the uninformed subsidy. So choosing between public banks, informed subsidies and uninformed subsidies, both the politician and the public prefer the same institution; the public bank. *Third*, public banks can be welfare-optimal if  $X_{\text{Soc}} > 0$ .

## 6 Discussion of Results

**Empirical Predictions** We first take a normative perspective and ask how the deadweight loss of taxation  $d_{\text{Soc}}$  should influence policy measures. The deadweight loss  $d_{\text{Soc}}$  depends on the quality of the tax system, i.e. its ability to avoid distortions. It is argued that the deadweight loss of taxation increases through "globalization", or more precisely, increased factor mobility. As some factors of production become more mobile, they can only be taxed less (Lucas and Frank, 2005). As a result, immobile factors have to bear a higher tax burden and, thereby, the deadweight loss of taxation increases. In our model this implies that the degree of interventions by the politician should decrease. Thus, we should observe that public firms are privatized, public banks are privatized and subsidization is limited. At least the first two effects can be observed in almost all regions of the world.

The recent empirical studies on public banks show that politicians try to maximize their own utility. We will compare institutions chosen by politicians that operate in economies differing in either  $d_{\text{Pol}}$ ,  $c$ , or  $X_{\text{Pol}}$ .

The tougher the control of politicians, the harder it is to abuse tax money. Hence, one could argue that the more developed the political system of a country, the higher the politician's disutility from taxation,  $d_{\text{Pol}}$ . Let us call a political system with a high  $d_{\text{Pol}}$  strong, one with a low  $d_{\text{Pol}}$  weak. Then in weak political systems, politicians will c. p. tend to nationalize firms, and tend not to interfere with the

economy in strong political systems (see Figure 2). If public banks are available, politicians make use of them in political systems of medium strength (see Figure 2). If public banks are not an option, politicians tend to use informed or informed subsidies. In the terms of our model, a higher electoral participation increases  $d_{\text{Pol}}$ , making it more expensive for the politician to pursue his own goals. In the end, the politician will abandon projects which generate a relatively low private benefits for him. Evidence from Pakistan, which shows that rents distributed by state-owned banks decrease as electoral participation increases, is in line with this prediction.

Next, we discuss which institution the politician chooses c. p. for different externalities  $X_{\text{Pol}}$ . For example, the politician has personal benefits from some industry (or firm), or an industry (or firm) employs a large part of the politician's electorate. In these cases,  $X_{\text{Pol}}$  is rather high. The politician will tend to nationalize firms with a high  $X_{\text{Pol}}$ . He will leave firms with a low  $X_{\text{Pol}}$  alone. Firms with an intermediate  $X_{\text{Pol}}$  will be financed, and subsidized indirectly by public banks. If that is not an option, these firms tend to be subsidized directly, without prior advice from a consultant if  $c$  is high, and with prior advice if  $c$  is low.

Finally, we look at the preferred institution depending on the screening costs  $c$  holding  $d_{\text{Pol}}$  and  $X_{\text{Pol}}$  constant. The screening costs can be used to compare countries with different levels of financial development or different sectors within one country. One may want to identify a high  $c$  with rather innovative industrial sectors, where it is difficult to evaluate the probability of success of a project. A low  $c$  can be identified with traditional industries, where credit specialists already possess a certain knowledge how to evaluate the probability of default, and hence need to exert less effort. Then public banks are used to finance rather traditional industries; innovative firms can be nationalized or left alone (depending e. g. on  $d_{\text{Pol}}$  and  $X_{\text{Pol}}$ ). If public banks are not an option, traditional firms tend to be subsidized. The more traditional of them receive an informed subsidy. The less traditional of them receive an uninformed subsidy as the higher screening costs should be avoided. For a cross-country comparison, one may want to identify economies with high screening costs  $c$  with emerging market economies. Our model then predicts that in emerging markets economies, politicians tend to nationalize, if they choose to intervene at all. In more developed economies, the use of public banks should be more widespread.

**Policy Implications** Our model can be used to, very tentatively, derive some policy implications. Having a public bank is in certain parameter ranges a second best solution. The first best solution would be the laissez faire case. Since politicians maximize their own utility, they opt for some kind of intervention. The fundamental cause of this "inefficiency" is the self-interested nature of the politician. The most

fundamental way to deal with it is to increase the politician's costs of intervention. This can be reached by increasing  $d_{\text{pol}}$ . Thus, if the democratic control of the politician increases, an intervention increases his utility less. As a result, the degree of intervention will decrease.

Our analysis clearly indicates that the discussion whether public banks are good or evil should not be conducted without considering the alternatives. The propositions in the paper show that subsidies (informed or uninformed) are dominated by public banks, from the politician's as well as from a welfare perspective. Suppose that in a state with public banks, these banks are banned. Then the politician will tend to switch to one of the two kinds of subsidization, both leading to higher tax distortions. Hence, public banks should be banned only if *laissez faire* is the preferred (available) alternative for the politician. In all other cases, the politician will switch to institutions that are more inefficient than public banks.

Furthermore, the social externality  $X_{\text{soc}}$  may be positive even in cases where a politician maximizes its own utility. In such cases, the politician may install the socially optimal institution, even if he is only interested in his own utility. Even if the politician opts for an institution that is not socially optimal, the alternative may lead to a loss in social welfare (with the only exception of a potential switch to *laissez faire*).

We want to emphasize that public banks dominate subsidies as institutions only if competition with private banks is restricted (see Remark 2). One potential way to design such a restriction is not to allow public banks to match the loan rates of their private competitors. This restriction guarantees that public banks grant loans only to firms that do not have access to private loan markets. As an alternative to banning public banks, one could also ensure that they are disadvantaged when competing against private banks.

Finally, our model teaches that the corporate governance of the public bank is crucial. In the institution that we propose in section 4.3, the public banker maximizes profits given some constraints set by the politician, he must be partially independent from the politician. If the politician interferes in this partial independence, he risks to subsidize bad project, or to waste subsidies on excellent projects. The examples provided in the review of the literature confirm the crucial role of corporate governance. The Japan Development Bank has been very successful in financing the modernization of the Japanese economy because its management was independent of political decisions (Vittas and Cho, 1995). In contrast, politicians in Pakistan distribute political favors through the state-owned banks. Politicians influence decisions about loans by providing favors (e. g., promotions) to obedient bank clerks.

Interestingly, those public banks that explicitly have social objectives are not used to grant political favors (Khwaja and Mian, 2005). The evidence from Pakistan suggests that there must be fundamental differences between different types of public banks. Therefore, it would be interesting to study these differences and find out whether it is the corporate governance structure that drives the differences between public banks in Pakistan.

## 7 Conclusion

We started this paper with the observation that public banks are often viewed as a source of inefficiency. However, most of the recent empirical studies only compare the influence of the state ownership of banks in one country over time or across countries without taking opportunities into account, i. e., alternative instruments that a politician can use to subsidize desired projects. In our theoretical analysis, we study a politician that maximizes his own utility and compare the effect of different policy instruments.

We find that public banks are a cheaper policy measure for the politician to pursue his own goals than both kinds of subsidization, because they avoid windfall gains to entrepreneurs, and they economize on screening costs. For the same reason, they welfare-dominate subsidies. An important condition that this result is reached is that public banks must not be allowed to fully compete with private banks, otherwise they waste tax money and hence lose their efficiency advantage.

The theoretical analysis provides important insights concerning policy recommendations. Whether a public bank is beneficial depends on the costs of taxation, the size of the externality and the nature of the externality, i. e., whether the externality affects social welfare or the politician's own payoff function. Studies on Pakistan and India point out that the role of the electorate in controlling politicians has a significant impact on the effect that the state ownership of banks has on the economy. A better democratic control should not only help to limit the abuse of public banks by politicians but also to (for example) reduce corruption. Thus, the question arises whether the privatization of public banks really solves the source of the inefficiency (namely the politician's objective to pursue his own objectives) or is only curing its symptoms. Therefore, we want to emphasize that the topic of the state ownership of banks should be discussed in a very broad context. In order to derive precise policy recommendations, it is essential that more empirical research is undertaken that evaluates the costs of different policy instruments.

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