Essays on financial intermediation in developing countries

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Chapter 1
Insider Lending and Bank Ownership: The Case of Russia¹

Introduction

Banking crises have raged throughout the world leaving very few countries unscathed. Lindgren, Garcia and Saal (1996) report that during the period 1980-96 more than two-thirds of all IMF member countries experienced significant banking sector problems. Table 1.1 shows the magnitude of the fiscal costs that recent banking crises have imposed on some countries.

Table 1.1: Fiscal costs of selected banking crises

<table>
<thead>
<tr>
<th>Country</th>
<th>Fiscal Costs (in % of GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina (1980-82)</td>
<td>13-55</td>
</tr>
<tr>
<td>Brazil (1994-96)</td>
<td>4-10</td>
</tr>
<tr>
<td>Chile (1981-85)</td>
<td>19-41</td>
</tr>
<tr>
<td>Finland (1991-93)</td>
<td>8-10</td>
</tr>
<tr>
<td>Indonesia (1997-99)</td>
<td>50-55</td>
</tr>
<tr>
<td>Malaysia (1997-99)</td>
<td>21</td>
</tr>
<tr>
<td>Mexico (1994-95)</td>
<td>12-15</td>
</tr>
<tr>
<td>Russia (1998-99)</td>
<td>5-7</td>
</tr>
<tr>
<td>South Korea (1997-99)</td>
<td>27</td>
</tr>
<tr>
<td>Spain (1977-85)</td>
<td>15-17</td>
</tr>
<tr>
<td>Thailand (1997-99)</td>
<td>33</td>
</tr>
<tr>
<td>United States (1984-91)</td>
<td>5-7</td>
</tr>
<tr>
<td>Uruguay (1981-84)</td>
<td>31</td>
</tr>
<tr>
<td>Venezuela (1994-95)</td>
<td>17</td>
</tr>
</tbody>
</table>

Sources: IMF World Economic Outlook (1998), Caprio and Klingebiel (1999). The fiscal costs are estimates in percent of annual GDP during the restructuring period. Where a range is shown, the lower estimate includes only costs of funds, credit, and bonds injected directly into the banking system, while the higher estimates includes other fiscal costs, such as exchange rate subsidies. The banking crisis years are reported between brackets.

Poor lending policies stand out among the causes of recent banking crises, in particular in countries with poor corporate governance and weak enforcement of regulations and laws. This chapter will focus on one of the most common poor lending policies, namely lending to insiders², in the case of Russia. Russia is a case of particular interest, because ownership links between Russian borrowers and their banks seem to

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¹ A slightly different version of this chapter is forthcoming in the June 2001 edition of the Journal of Comparative Economics.
² Lindgren, Garcia and Saal (1996, Table 14) and Caprio and Klingebiel (1999) show that in most of the recent banking crises there has been extensive insider lending.
have fostered insider lending. Furthermore, Russia is an excellent example of a country with a weak institutional framework.

A bank can extend loans to several types of insiders, including major shareholders, subsidiaries, affiliated companies, directors, executive officers, and members of the board of directors. A potential for abuse exists when insiders receive loans at favourable terms. If the favourable conditions are due to the availability of more information and, therefore, less uncertainty on the borrower, such loans should not be a major concern. However, if favourable terms on insider loans exist relative to similar risky loans, and the bank has allocated a substantial percentage of its loans to such activities, then the issue should be of concern to the regulator as well as the shareholders. An example of a looser than appropriate lending condition is to lend at a rate that is lower than the risk of the loan would require. Another potential problem with insider loans is that insiders might be given less incentives than outsiders to repay a loan on time or at all. In some cases, bank managers may simply roll-over the bad debts of insiders with whom they have close ties. Thus we define insider lending as lending to insider parties, that are connected to the bank through the ownership or the ability to control, on conditions and volumes that are looser than appropriate. Insider lending is also known as connected lending, because the favourable terms pertain to parties that are connected with each other through control or cash flow rights.

Kummer, Arshadi and Lawrence (1989) state that in a professionally managed bank in which the managers have negligible ownership, there is an incentive to collude with insider-borrowers to the detriment of both the regulator and the shareholders. This paper shows that, first, even if bank managers have significant ownership there may still be an incentive for the bank manager to collude with insider-borrowers, and, secondly, that even shareholders may want to engage in insider lending practices at the expense of the value of their share in the bank’s equity. As a special case, we look at the situation in which principal shareholders of the bank are also potential large borrowers of the same bank. These large shareholders are present on the management board of the bank.

During the Soviet Regime, the Russian banking system consisted of a single, monolithic bank owned by the state. Financial reform in 1987 created three regional

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3 Caprio and Klingebiel (1999) report that on August 24, 1995, the Russian interbank loan market stopped working due to concern about connected lending in many new Russian banks.
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banks spun-off from the former state bank. Since the financial reforms in the early 1990s, a large number of private banks, over two thousand by 1993, has been established in Russia. With virtually no shareholding restrictions in place, ownership of these banks tends to be highly concentrated. Because of the freedom to set up and own banks, enterprise shareholding of banks has become widespread.

According to Claessens and Pohl (1994), ownership in the new private banks is concentrated with the five largest shareholders often controlling for as much as half of the shares. Ownership of the three spin-off banks is more diversified with the five largest shareholders controlling about 25 percent of the shares. According to a bank survey in 1994, the results of which are presented in Belyanova and Rozinsky (1995), ownership of new banks is dominated by new private companies, while former state banks are held by state institutions, state enterprises, private enterprises and individuals with each having about 25 percent of the shares. Bank ownership of enterprises is much less widespread, and, since 1994, it has been limited by banking regulation to 10 percent of the stock of a single company (Akamatsu, 1995, and Litwack, 1995).

Bergløf (1995) states that such extensive enterprise ownership of banks in Russia has perpetuated insider lending. The survey in Belyanova and Rozinsky (1995) shows that banks that are owned by enterprises prefer to extend loans to these companies in over 80% of cases. Another survey carried out in 1993 and reported in Litwack (1995) also documents a strong preference of banks to finance enterprises that are holding their shares. In some cases, these enterprises accounted for 90 percent of all credits. Insider lending in Russia has saddled the banks with large amounts of overdue debt and observers have argued that such preferential loans need to be drastically reduced (Van Wijnbergen, 1997).

A contributory factor to the growth of insider lending has been the fact that the interests of members of the board of directors of Russian enterprises are aligned with the interests of the major shareholders of those enterprises, since, as reported by Akamatsu (1995), Russia’s company law did until recently not allow outsiders who do not represent the interests of the major shareholders into the board of directors. Another contributory factor to insider lending has been the fact that the implementation of bankruptcy law has been minimal in Russia. Perotti (2000) reports that removing insiders from control has
turned out to be almost impossible, and the law has explicitly excluded its applicability to banks from its introduction in 1990 until its reform in 1999.

The paper proceeds as follows. Section 1.1 presents a model of insider lending. This model helps to explain why we often observe insider loans going to firms that are also large shareholders of the bank. Section 1.2 presents the Russian firm-level survey data. Section 1.3 uses this data to test for evidence of insider lending in Russia. The results indicate that Russian firms and banks engaged in insider lending based on differential loan volume. Section 1.4 proposes ways to limit insider lending. Section 1.5 presents some recent developments in Russian corporate financing. Section 1.6 concludes.

1.1 A Model of Insider Lending

In this section, we model insider lending as the special case in which a bank manager extends loans at subsidised interest rates to a borrower who is willing to return part of the subsidy as a private benefit to the bank manager. The private benefit is in effect a bribe of the borrower to the bank manager. We neglect for simplicity that granting loans to insiders may benefit from relationship banking, and that insiders might have less incentives than outsiders to repay a loan on time or at all. In the model, every borrower can bribe, but the shareholders of the bank, who are potential borrowers as well, have the power to fire the bank manager. Since the shareholders will use this power if the bank manager extends insider loans to borrowers other than the shareholders themselves, the bank manager has a reason to favour shareholders. Because the power of a single shareholder increases with the amount of voting rights that he owns, and with the size of his stake in the bank’s share capital in general, a particular shareholder will have a better opportunity to get insider loans if he has a larger equity stake in the bank. However, it is not obvious that a shareholder finds it in his self-interest to bribe the bank manager for insider loans, because the value of his equity stake in the bank will decrease in proportion to the subsidy. The bank shareholder faces a trade-off in that his personal project financed by the bank benefits from the cheaper loan, but the value of his equity stake in the bank decreases. If insider lending to a shareholder occurs, it must be true that his benefit from engaging in insider lending is larger than his cost. In what follows, we
model this trade-off explicitly by following an incentive approach based on Boot and Thakor (1993).

At $t=0$, the bank can extend a loan of $1$ to invest in a discretionary asset that requires an investment of $1$ and gives a payoff to the bank of $\bar{R}$ at $t=1$. $\bar{R}$ equals $R(\theta) > 0$ with probability $\theta$ and $0$ with probability $1-\theta$, with $R'(\cdot) < 0$ and $R''(\cdot) \leq 0$. To simplify, we assume that there is no moral hazard, because the bank manager has full information over $\theta$, and that there is an unlimited range and amount of projects available to the bank. In effect, this means that the bank manager owns the control right to choose the project to be financed, i.e. that the bank manager can choose $\theta$, which can be seen as the loan quality. In addition to the $1$-loan, the bank already owns assets at $t=0$ that pay off a random amount $\bar{y}$ at $t=1$ and nothing thereafter, where $\bar{y}$ has a distribution $F(.)$ and a probability density $f(.)$ with support $[0, \bar{y}]$ and $\bar{y} > 0$. For ease of notation we define the expected value of these assets to be $E(\bar{y}) = \int \bar{y} f(\bar{y}) d\bar{y}$. The bank manager is put on a flat wage scheme. His wage is $w$ regardless of the profits of the bank, and equals his outside opportunities $\bar{u}$. The bank’s shareholders, however, can fire the bank manager for not maximising the bank’s profits. Although the bank manager has the same outside opportunities, making him in principle indifferent between any choice of $\theta$, we assume that a bank manager with a flat wage incentive scheme will choose $\theta$ such as to maximise the profits of the bank. The investment is financed with $K$ of book capital (put in by shareholders) and with $(1-K)$ of deposits. The bank pays the depositors $r^f$, which equals one plus the riskless rate for simplicity. The amount of capital that a bank can raise is limited. We assume that there is no explicit deposit insurance and that depositors do not exercise market discipline. All parties are assumed to be risk neutral.

The bank is closed at $t=1$, if $\bar{y} + \bar{R}$ is less than the obligation to the depositors. We assume that $\bar{y} < (1-K)r^f$, or that the maximum possible return on the bank’s other assets is smaller than the promised payment on its newly acquired liabilities. This assumption

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4 In the case of Russia there is no deposit insurance, and depositors are not expected to discipline bankers, because of lack of information. Assuming risk-insensitive deposit insurance would, however, not change the results of the model and could easily be incorporated by normalising the deposit insurance premium to zero.
implies that the bank defaults on its newly acquired liabilities $(1-K)$ and is thus insolvent whenever the newly financed project fails, i.e. realises a return of zero. Consequently, an implicit assumption underlying the model is that the newly financed project is large relative to the bank’s existing assets.

Throughout this chapter, we assume that the regulator is prudent, meaning that we are not in a world of self-interested regulators as in Boot and Thakor (1993). In such a world, insider lending could explode because a bank manager who is bribed by a borrower can simply bribe the regulator in turn for not playing the police officer. Such a recursive game of bribery has been modelled by Basu, Bhattacharya, and Misra (1992).

If there would be no insider lending, then there will be no collusion and the bank manager simply maximises\(^5\): \(\max_{\theta} E(\tilde{\gamma}) + \theta(R(\theta) - (1 - K)r^f)\) which gives as the optimal choice for loan quality

\[
\hat{\theta} = \frac{-R(\hat{\theta}) + (1 - K)r^f}{R'(\hat{\theta})}.
\]

We assume that \(R(\hat{\theta}) > (1 - K)r^f\), that is, the optimal project gives a positive return to the bank in the case of success. This choice of the project quality does, however, not give the social optimum, which would be achieved with an all equity-financed project that solves: \(\max_{\theta} E(\tilde{\gamma}) + \theta R(\theta)\) with \(\theta^* = -R(\theta^*) / R'(\theta^*)\). It follows that \(\hat{\theta} < \theta^*\), because of moral hazard (Boot and Thakor, 1993).

We consider the possibility that a borrower may bribe the bank manager in return for an insider loan, that is, a loan on favourable terms. In terms of the model, such favourable terms can be interpreted as funding a project of sub-optimal quality \(\theta < \hat{\theta}\) at a rate of \(R(\hat{\theta})\). The gross expected benefit of such a loan to the borrower will be \(\theta(R(\theta) - R(\hat{\theta}))\}. In return for the insider loan, the bank manager receives a bribe \(\gamma \theta(R(\theta) - R(\hat{\theta}))\) equal to a proportion of the gross expected benefit to the borrower, where \(\gamma \in [0,1]\). The bribe occurs as a private benefit to the bank manager. A self-interested bank manager with only a flat wage incentive scheme, \(w\), will accept such a bribe. The net expected benefit to the bribing borrower is then \((1 - \gamma)\theta(R(\theta) - R(\hat{\theta}))\). By

\(^5\) Since \(E(\tilde{\gamma})\) does not depend on \(\theta\) there is no need to include this term in the objective function.
extending the insider loan, the expected equity value of the bank will increase by only
\[ \theta(R(\theta) - (1 - K)r^f) \] instead of \[ \hat{\theta}(R(\hat{\theta}) - (1 - K)r^f) \], making the shareholders of the bank worse off.

The prudent bank regulator wants to prevent insider lending and will monitor the bank's choice of the combination \( \{\theta, R(\theta)\} \). We will, however, assume that it is difficult for the regulator to find out whether this combination is optimal and that it is easy for the bank manager to hide information on insider lending from the regulator. In this case the bank regulator observes only \( R(\theta) \), the interest payments on the loan, but not \( \theta \), the true risk of the loans, which is observed only by the bank's insiders, hence to the bank manager and the borrower. We model the monitoring effort of the bank regulator by the parameter \( \eta \), which is the probability that the regulator spots the inferior loan quality \( \theta \). If the regulator finds out that insider lending is occurring, the bank manager will be fired and a fair interest rate \( R(\theta) \) will be imposed on the borrower. We ignore the case in which the bank manager can also give insider loans to himself. In most countries, this form of abuse is extremely limited by the regulator by putting a limit on the loans that the bank manager can give to himself, and has to be approved by the management board, in particular the shareholders, who will in general not agree to such practice.

In principle, all potential borrowers can bribe the bank manager for an insider loan. There will thus be a competition for bribing which will ultimately drive the benefit for the borrower of bribing to zero. Knowing this in advance, borrowers will not bribe, at least borrowers who do not own the bank's equity. Borrowers who are bank shareholders, from now on classified as shareholder-borrowers, may still be able to bribe profitably, because they may be able to fire the bank manager for not co-operating. The threat of firing will force the bank manager to accept a smaller bribe from the bank shareholder than from other borrowers, giving the outside project of the bank shareholder a positive expected profit. Of course, the latter benefit is at the expense of the expected value of the bank's equity.

We model that a bank shareholder can fire the bank manager with probability \( \phi(\alpha) \) for not co-operating, with \( \alpha \) the share of the voting rights of the bank that this particular shareholder owns. We assume that \( \phi'() > 0, \phi''() > 0, \phi(1) = 1, \) and \( \phi(0) = 0 \). Like the bank regulator, a bank shareholder observes only \( R(\theta) \), and not the true level of \( \theta \), if the bank
co-operates with another borrower. We assume that the shareholders find out that the bank manager has extended an insider loan to a borrower other than himself with probability \( \psi \), in which case the bank manager is fired and the borrower has to repay the true \( R(\theta) \). This probability is assumed to be independent of the stake that the particular shareholder has in the bank. For simplicity we will model only two bank shareholders. One shareholder, Borrower Type I, has a majority stake in the bank of \( \alpha_I > 0.5 \), and the other shareholder, Borrower Type II, has a minority stake in the bank of \( \alpha_{II} < 0.5 \), with \( \alpha_I + \alpha_{II} = 1 \). It follows that \( \phi(\alpha_I) > \alpha_I \), and \( \phi(\alpha_{II}) < \alpha_{II} \). In addition, there is a large group of potential borrowers, classified as Borrower Type III, that do not own shares in the bank. We now have the following proposition.

**Proposition 1:** A bribed bank manager will fund a project of a certain quality, say \( \hat{\theta} \), that is of worse quality than the project a non-bribed bank manager would fund.

**Proof:** The payoff to the bank manager if “co-operating” with Borrower III is

\[
w + (1 - \eta)(1 - \psi)\gamma_{III} \theta[R(\theta) - R(\hat{\theta})] + (1 - \eta)\psi(1 - \phi(\alpha_I + \alpha_{II}))\gamma_{III} \theta[R(\theta) - R(\hat{\theta})],
\]

or

\[
w + (1 - \eta)(1 - \psi)\theta[R(\theta) - R(\hat{\theta})]. \tag{1.2}
\]

since \( \phi(\alpha_I + \alpha_{II}) = 1 \) and \( \gamma_{III} = 1 \) because of competition. Hence, the payoff to the bank manager would equal his wage plus the bribe times the probability that both the regulator and the shareholders do not spot insider lending. The bank manager will choose \( \theta \) such as to maximise (1.2), which gives the maximum choice for the quality of the insider loan \( \hat{\theta} = [-R(\hat{\theta}) + R(\hat{\theta})]/R'(\hat{\theta}) \) and the payoff to the bank manager would be

\[
w + (1 - \eta)(1 - \psi)\hat{\theta}[R(\hat{\theta}) - R(\hat{\theta})] \tag{1.3}
\]

Since \( \hat{\theta} = [-R(\hat{\theta}) + (1 - K)r^f]/R'(\hat{\theta}) \) and \( R(\hat{\theta}) > r^f > (1 - K)r^f \) it follows that \( \hat{\theta} < \hat{\theta} \).

Proposition 1 establishes the bribe to the bank manager when the manager receives all of the rents due to competition among bribers. Contrary to non-shareholder borrowers, shareholders are capable of gaining some returns to bribing because they can threaten to fire the manager. The ability to fire the bank manager and, therefore, to bribe successfully increases with the ownership stake. The private benefit that non-shareholder borrowers would provide to the bank manager forms a benchmark for the bribe that the shareholders
will have to pay. Proposition 2 establishes the ability of the majority shareholder to bribe the manager and pass on some of the cost to the minority shareholder.

**Proposition 2:** A majority shareholder can get an insider loan if he gives a certain share of his expected benefit, say $\gamma_1^*$, to the bank manager.

**Proof:** The maximum payoff to the bank manager if “co-operating” with Borrower II is

$$w + (1 - \eta)(1 - \psi) \gamma_H \tilde{\theta}(R(\tilde{\theta}) - R(\hat{\theta})) + (1 - \eta)\psi(1 - \phi(\alpha_I)) \gamma_H \tilde{\theta}(R(\tilde{\theta}) - R(\hat{\theta})),$$

or

$$w + (1 - \eta)(1 - \psi\phi(\alpha_I)) \gamma_H \tilde{\theta}(R(\tilde{\theta}) - R(\hat{\theta}))$$

with $\gamma_H$, the proportion of the loan subsidy that Borrower II returns to the bank manager as a bribe.

For the bank manager to prefer giving an insider loan to Borrower II instead of III, expression (1.4) has to be larger than (1.3) in expectation. This is true as long as

$$(1 - \psi\phi(\alpha_I)) \gamma_H > 1 - \psi \text{ or } \gamma_H > \frac{1 - \psi}{1 - \psi\phi(\alpha_I)}.$$

The majority shareholder needs even a smaller bribe than the minority shareholder. This follows from the payoff to the bank manager if “co-operating” with Borrower I, which is

$$w + (1 - \eta)(1 - \psi\phi(\alpha_I)) \gamma_I \tilde{\theta}(R(\tilde{\theta}) - R(\hat{\theta}))$$

with $\gamma_I$, the proportion of the loan subsidy that Borrower I returns to the bank manager as a bribe. For the bank manager to prefer giving an insider loan to Borrower I instead of II or III, expression (1.5) has to be larger than both (1.3) and (1.4) in expectation. This is true as long as

$$\gamma_I > \frac{1 - \psi}{1 - \psi\phi(\alpha_I)} \frac{1 - \psi}{1 - \psi\phi(\alpha_H)}.$$

From (1.6) it follows that a bribe from the majority shareholder will be preferred by the bank manager, if

$$\gamma_I^* = \frac{1 - \psi}{1 - \psi\phi(\alpha_H)}.$$

It follows that $\gamma_I^* < 1$, giving the majority shareholder a gross benefit of

$$(1 - \eta)(1 - \psi\phi(\alpha_H))(1 - \gamma_I^*) \tilde{\theta}(R(\tilde{\theta}) - R(\hat{\theta})) > 0.$$
for Borrower II than for Borrower I, even though Borrower II has to give a higher bribe. This is captured by the following proposition.

**Proposition 3:** There exists a critical level of the shareholding of the majority shareholder, say $\alpha^*_I$, above which the majority shareholder will not bribe the bank manager to engage into insider lending, because the costs in terms of the value destruction of his share in the bank’s equity outweighs the benefits. The critical level $\alpha^*_I$ does not depend on the probability $\eta$ that the regulator discovers insider lending.

**Proof:** Without bribing, the expected payoff to the majority shareholder is $\alpha_I [E(\tilde{y}) + \tilde{\theta}[R(\hat{\theta}) - (1 - K)r^f]]$. If the majority shareholder bribes for an insider loan, then his expected payoff equals the expected payoff from his bank shares plus the expected benefit from the insider loan, or

$$\alpha_I [E(\tilde{y}) + (1 - \eta)(1 - \psi(\alpha_H))\tilde{\theta}[R(\hat{\theta}) - (1 - K)r^f] + \eta \tilde{\theta}[R(\hat{\theta}) - (1 - K)r^f]] + (1 - \eta)(1 - \psi(\alpha_H))(1 - \gamma_I)\tilde{\theta}[R(\hat{\theta}) - R(\hat{\theta})]$$

In the proof of Proposition 2 we showed that a bribe from the majority shareholder will be preferred by the bank manager if $\gamma_I^* = \frac{1 - \psi}{1 - \psi(\alpha_H)}$. The majority shareholder will thus bribe if

$$\alpha_I [E(\tilde{y}) + (1 - \eta)(1 - \psi(\alpha_H))\tilde{\theta}[R(\hat{\theta}) - (1 - K)r^f] + \eta \tilde{\theta}[R(\hat{\theta}) - (1 - K)r^f]] + (1 - \eta)\psi(\alpha_H)\tilde{\theta}[R(\hat{\theta}) - R(\hat{\theta})] > \alpha_I [E(\tilde{y}) + \tilde{\theta}[R(\hat{\theta}) - (1 - K)r^f]]$$

or if

$$\psi(1 - \psi(\alpha_H))\tilde{\theta}[R(\hat{\theta}) - R(\hat{\theta})] > \alpha_I (1 - \psi(\alpha_H))\tilde{\theta}[R(\hat{\theta}) - (1 - K)r^f] - \tilde{\theta}[R(\hat{\theta}) - (1 - K)r^f]$$

or if

$$\alpha_I < \frac{\psi(1 - \psi(\alpha_H))\tilde{\theta}[R(\hat{\theta}) - R(\hat{\theta})]}{(1 - \psi(\alpha_H))\tilde{\theta}[R(\hat{\theta}) - (1 - K)r^f] - \tilde{\theta}[R(\hat{\theta}) - (1 - K)r^f]} = \alpha^*_I$$

(1.7)

Both the numerator and the denominator of the ratio in (1.7) are positive, because $R(\hat{\theta}) > R(\hat{\theta})$ and because $\tilde{\theta}$ maximises $\tilde{\theta}[R(\hat{\theta}) - (1 - K)r^f]$. It will depend upon the model parameters and on the variables $\hat{\theta}$ and $\hat{\theta}$ whether inequality (1.7) holds, and thus whether the majority shareholder will initiate the bribe. Note that (1.7) does not depend on the regulator parameter $\eta$. □

It is clear from the above that a bribe from the majority shareholder will be at the expense of the minority shareholder, whose shares decrease in value. Since this can be anticipated, the question arises why any one would become or remain a minor
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shareholder. An explanation is that the expected rents of the bank are sufficiently high to offer the minority shareholder a competitive rate equal to his outside opportunities, even in the presence of insider lending. Another explanation is simply that the minority shareholder is an uninformed agent. An obvious candidate is the government, who often has rather passive, minority stakes in banks. Competition for the majority ownership of a bank during a privatisation process offers a third explanation. The shareholders that loose the competition become minority shareholders and face the risk of being exploited by the majority shareholder. This explains why such minority shareholders are likely to remain minority shareholders. Although they may want to sell off their minority stakes, it will be hard to find potential buyers for a minority stake, in particular if majority shareholders abuse their powers and the protection of shareholder rights is poor. In addition to an inefficient allocation of credit, such abuse of concentrated bank ownership may turn off the function of banks as corporate governors.

If the bank would have only one shareholder, then $\alpha_i = 1, \alpha_{ii} = 0, \phi(\alpha_{ii}) = 0, \psi = 0$ together with (1.7) requires $\tilde{\theta}(R(\tilde{\theta}) - (1 - K)r^f) > \tilde{\theta}(R(\tilde{\theta}) - (1 - K)r^f)$ which cannot hold because $\tilde{\theta}$ maximises $\theta(R(\theta) - (1 - K)r^f)$. Obviously, a shareholder of the bank only wants to bribe the bank manager if he can do it at the expense of other shareholders to share the loss on the value of the equity value of the bank. If there is only one bank shareholder then insider lending will not occur, because the shareholder will loose on his equity what he gains on the loan.

1.2 Russian Firm-Level Survey

In mid-1994, the World Bank conducted a survey of 439 Russian industrial enterprises employing 15 or more persons. The information was collected through interviews with top management. The survey provides excellent data to analyse the relations between firms, banks and credit in Russia from the perspective of firms. The majority of the enterprises selected are privately owned (26% state-owned, 64% privatised, and 11% private companies). The sample was drawn from the Goskomstat database, which comprises 23,000 enterprises, and from lists at local statistical offices. For more details
with respect to the survey we refer to the Appendix in Commander, Fan, and Schaffer (1996).

The data from the World Bank survey has already been used by Fan, Lee, and Schaffer (1996) to analyse the relations between firms, banks and credit in Russia. They find that being a majority shareholder of banks is not significantly correlated with a greater ease of obtaining bank credit. This lack of effective influence is also found to be reflected in the actual volumes of borrowings and in the interest rates paid. Shareholders do not have larger bank loans compared to non-shareholders, nor more favourable repayment terms. On the basis of these results Fan, Lee, and Schaffer (1996) conclude that, although the number of enterprises which hold shares in banks is significant, there is no apparent impact of such shareholding on credit allocation. As we will see in section 3, their findings are partly the result of estimation with a single independent variable only, and therefore of not controlling for firm-specific factors.

With respect to ownership features the sample has the following characteristics: (1) managers have large ownership of firms (in 76% of firms they own 5% or more of the shares, and in 17% of firms they own 50% or more of the shares); (2) manager shareholders have a dominant influence on the decisions regarding financial issues (this is the case in 68% of firms that have shareholder managers); (3) managers are very often on the board of directors (this is the case in 85% of firms); (4) firms are often shareholders in the bank granting their loans (in 46% of firms that have loans outstanding the firm is a shareholder in the bank granting the largest loan, and in 13% of firms even a majority shareholder); and (5) banks are almost never shareholders in the firms to which they grant loans (in only 4% of firms is the bank a shareholder, and in only 0.5% of the cases is the bank a majority shareholder).

With respect to financing features the sample has the following characteristics: (1) firms find it difficult to get long-term loans from a bank on commercial terms (in 75% of cases the firms find it fairly difficult up to impossible to get long-term bank loans); (2) firms find it easy to get short-term loans from a bank on commercial terms (in 69% of cases the firms find it fairly easy up to very easy to get short-term bank loans); (3) many companies have payment problems (57% of firms have failed to repay a bank loan or make an interest payment on time at least once in the past two years); (4) a large amount of companies does not have bank credit outstanding (40% of banks have zero bank
credit); (5) commercial banks are the main source of loans (in 73% of cases a commercial bank is the source of the largest loan outstanding – other sources are other firms, the Central Bank of Russia, or the government); and (6) some credit extended by commercial banks is not on commercial terms, i.e., the interest rate is below the CBR discount rate.

1.3 Empirical Evidence of Insider Lending in Russia

Loans can be on preferential terms with respect to either the interest rate or the size. In the model in section 1.1 we defined insider lending as extending a loan of sub-optimal quality \( \theta < \hat{\theta} \) at a rate of \( R(\hat{\theta}) \). Although the model focused on the quality of the loan, interest favour and size favour can be incorporated in the model as follows. Since the fair rate on a loan of sub-optimal quality \( \theta \) should have been \( R(\theta) \), which is higher than \( R(\hat{\theta}) \), the interest rate has been set too low. Insider lending as defined in the model can thus be interpreted as lending with interest favour. The model considers a loan of $1 of optimal quality \( \hat{\theta} \). A loan of size larger than $1 is likely to be of lower quality than \( \hat{\theta} \), that is of higher risk (other things equal). Therefore, if a loan larger than $1 would be extended instead of the standard loan of $1, then a loan of sub-optimal quality \( \theta \) would be extended at a rate of \( R(\hat{\theta}) \). Insider lending as defined in the model can thus be interpreted as lending with size favour as well. It thus follows from Propositions 1-3 of the model in section 1.2, that majority bank shareholders should receive loans from their banks of larger size and/or lower interest rates than others in return for a bribe, at least if the shareholding does not exceed the critical level put forward in Proposition 3.\(^6\)

In this section we test for the special case of insider lending in which majority bank shareholders receive bank loans with favourable size and/or interest rate. Before testing whether majority shareholders received interest or size favour, we analyse whether relationship banking was prevalent in Russia around 1994. In our model of insider lending we neglect that granting loans to insiders has the potential of extracting rents from relationship banking benefits, and focus only on the dark side of insider lending,

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\(^6\) For most firms, the majority shareholding is expected not to exceed the critical level put forward in Proposition 3, given that the typical majority stake in Russian banks for the sample of firms is 50%.
namely the fraudulent behaviour of granting loans at favourable terms. The conclusions of the model may not hold if relationship banking is prevalent.

Lending to insiders may have certain benefits of relationship banking, in particular the mitigation of certain informational asymmetries between the lender and the borrower. Such benefits may be large if there are ownership links between the bank and its borrowers. The presence of borrowing firms on the management board of the bank may give the bank manager the benefit of access to more information on these borrowing firms, which improves the quality of loans made to those insiders, and potentially may give the bank manager more information on other firms in the same industry. If informational asymmetries between banks and their borrowers are lower for certain clients, then it would be accepted for the bank to extend loans on preferential terms to these clients, that is, on better than commercial terms. Such clients could be firms that are owned by the bank, firms that own shares in the bank, and firms that have a lot of debt outstanding with the bank.

Since firm ownership by banks was not common in Russia in 1994 (only 0.4% of firms in our data set had a bank as majority shareholder), the first type of informational link between banks and their clients can be neglected. To assess the importance of the other two linkages, we analyse whether it is easier for shareholders and large borrowers to get credit on commercial basis, that is on fair terms and without bribes. One would expect such a link, if relationship banking is prevalent. As proxy for large borrowers we use the amount of credit outstanding to sales, and as indicator for bank ownership we use a dummy variable that takes value one if the firm is a majority shareholder in a bank, and zero if the firm is not a shareholder or a minor shareholder. The data enables us to distinguish between the financing constraints with respect to both long-term and short-term loans. The survey has classified the ease of obtaining credit into 5 categories. The financing constraint variable takes value “zero” if it is “very easy”, “one” if it is “fairly

---

7 Lending to insiders can have distinct advantages if the formal financial system is underdeveloped, and the availability of information and capital are scarce. An example is lending to related group firms. Perotti and Gelfer (1999) study the case of Russia during 1995-96 when financial-industrial groups were established and engaged into informal lending arrangements to group members, and find that financial-industrial groups exhibit extensive reallocation of financial resources within groups. This indicates that allocating funds within a group has evident informational advantages.

8 At the end of 1994, financial-industrial groups emerged with banks taking substantial equity positions in industrial group firms. Our data set includes data only until mid-1994, and therefore does not include financial-industrial groups.
easy”, “two” if it is “fairly difficult”, “three” if it is “very difficult”, and finally “four” if it is “impossible” to obtain credit on commercial basis.

We follow Pinto and Van Wijnbergen (1994) by using an ordered logit procedure to estimate the ease of obtaining credit on commercial basis as a function of the amount of credit to sales, bank ownership, and control variables. As control variables we include the firm’s profit to sales, a dummy variable indicating if the firm had credit repayment problems during the past two years, a private ownership dummy, and industry dummies. We expect that it is easier to obtain credit for firms that are profitable and that have had few credit repayment problems in the past, because the risk of non-repayment is perceived to be lower for these firms. We include a private ownership dummy to control for potential differences in the ease to get bank credit between state and private enterprises. Government-owned enterprises tend to get higher government subsidies, which unfairly improves their financial situation, and may therefore find it easier to get bank credit. State-owned enterprises in transition economies have another advantage over private firms. As has been argued by Perotti (1993), after the financial reform Russian banks might have been inclined to give more funds to their loss-making former debtors, which are state-owned enterprises, to gain the potential repayment of previous debt. We specify the same model for both the severity of the long-term borrowing constraint and the short-term borrowing constraint. The estimation results for the two models can be found in Table 1.2. The standard errors are corrected for heteroskedasticity.

The sample for the regressions in Table 1.2 includes both firms with and without bank loans. Of the 439 firms originally surveyed, only 386 firms answered the question on the difficulty of getting either a long-term or a short-term bank loan on commercial terms. Of these, only 240 firms provided information on their profitability. The sample used in the regression is reduced to 161 observations because another 79 firms did not answer questions related to some of the other regressors.
Table 1.2: Financing constraints and bank ownership in 1994 - ordered logit model

<table>
<thead>
<tr>
<th>Variable</th>
<th>(a) Difficulty to get a long-term bank loan on commercial terms</th>
<th>(b) Difficulty to get a short-term bank loan on commercial terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit</td>
<td>-0.1949 (.5965)</td>
<td>-0.1871 (.5457)</td>
</tr>
<tr>
<td>Profit</td>
<td>-0.0005 (.0122)</td>
<td><strong>-0.0318 (.0121)</strong></td>
</tr>
<tr>
<td>Payment Problems</td>
<td><strong>-1.217 (.3695)</strong></td>
<td><em>0.6265 (.3528)</em>*</td>
</tr>
<tr>
<td>Private Ownership</td>
<td>.9397 (.5745)</td>
<td>2.978 (.5211)</td>
</tr>
<tr>
<td>Bank Ownership</td>
<td>.8198 (.6525)</td>
<td>1.835 (.5340)</td>
</tr>
</tbody>
</table>

Number of observations 161
χ²-statistic 101.87 80.31
p-value 0.000 0.000
Pseudo-R² .117 .095

Notes: The dependent variable of the regression model in column (a) is the difficulty as of mid-1994 to get a long-term loan from a bank on commercial terms. The variable takes value 0 if it is "very easy" to get a long-term loan from a bank on commercial terms, 1 if it is "fairly easy", 2 if it is "fairly difficult", 3 if it is "very difficult", and 4 if it is "impossible" (i.e., long-term bank financing is completely unavailable). The dependent variable of the regression model in column (b) is the difficulty as of mid-1994 to get a short-term loan from a bank on commercial terms. The variable takes value 0 if it is "very easy" to get a short-term loan from a bank on commercial terms, 1 if it is "fairly easy", 2 if it is "fairly difficult", 3 if it is "very difficult", and 4 if it is "impossible" (i.e., short-term bank financing is completely unavailable). Credit is the amount of credit outstanding with banks as of mid-1994 scaled by sales. Profit is the profit of the firm as % of sales revenue as of mid-1994. Payment problems is a dummy variable that takes value one if the firm had repayment problems as of mid-1994, i.e. has failed in the past two years to repay a bank loan or to make an interest payment on time, and zero otherwise. Private ownership is a dummy variable that takes value one if the company is private as of mid-1994, and zero otherwise. Private firms include firms that have always been private and firms that had been privatised as of mid-1994. Bank ownership is a dummy variable that takes value one if the firm is a majority shareholder of a bank, and zero if the firm is not a shareholder or a minor shareholder. Both models are specified as an Ordered Logit model. Industry dummies were added, but are not reported. Heteroskedasticity robust standard errors are reported in parentheses. The χ²-statistic is a model specification test statistic and equals $2\left(\hat{L}_0 - \hat{L}_1\right)$, where $\hat{L}_1$ is the log-likelihood of the full-model and $\hat{L}_0$ is the log-likelihood of a constant-only model. The Pseudo-R² equals $1 - \hat{L}_1/\hat{L}_0$. The sign * indicates significance at a 10% level, ** indicates significance at a 5% level, and *** indicates significance at a 1% level.
We find that firms that own majority stakes in banks do not find it significantly easier or more difficult to get either long-term or short-term loans on commercial basis. The regression coefficients, although not statistically significant, even indicate that such shareholders find it more difficult to get loans on commercial basis. This suggests that the information asymmetries between banks and their shareholders are not different from those with other bank clients, that is, it is unlikely that Russian banks and their shareholders were engaged into productive relationship banking around 1994. Firms that have been major borrowers of banks are not found to find it significantly easier to receive more credit on commercial terms as well. This finding suggests that there is no indication of the presence of relationship practice between banks and their main customers. We also find that firms with repayment problems over the last two years find it substantially more difficult to get loans, especially long-term loans. In addition, firms with high current profits are found to find it easier to get short-term loans. Current profitability does not, however, significantly affect the ease to get long-term financing. In short, the results in Table 1.2 indicate that it is not easier both for majority shareholders and large borrowers to get loans on commercial terms, that is without bribing. We therefore find no indication of the presence of relationship banking between banks and their majority shareholders or main customers.

Next, we test for the presence of insider lending by analysing whether shareholders got larger loans and/or paid lower interest rates. Since we do not find evidence of relationship banking between banks and their shareholders, a direct link between shareholder preference and ownership can be interpreted as preferential lending and thus insider lending.

We first analyse whether majority bank shareholders got relatively larger loans. To answer this question we use as dependent variable the size of the largest loan of each firm scaled by sales and as independent variable a dummy variable that indicates whether the firm is a majority shareholder in the bank granting the largest loan. Loan size is scaled by sales to correct for a possible size effect. We use 1994\(^9\) data only to evade problems that

\(^9\) The data set comprises data for the years 1989-94; 60.4% of loans are extended in 1994.
may arise from using time series data, such as changes in inflation\textsuperscript{10}, and changes in the aggregate supply of and demand for credit. We correct for certain firm-specific factors. Firstly, we correct for the amount of other credit outstanding scaled by sales, since banks may extend more credit to firms that already have a large amount of credit outstanding, because lending relationships may reduce information asymmetries. Secondly, we add profits to sales to control for debt repayment capacity. Thirdly, we add a dummy variable indicating if the firm had credit repayment problems during the past two years. Fourthly, we include a private ownership dummy variable to correct for differences in the ability to receive loans among state and private enterprises.

OLS estimation of the above regression model that estimates the effect of bank ownership on loan size may suffer from a potential sample selection problem, in which case the estimates are inconsistent from a statistical point of view, because the sample of borrowers may not be a random sample of the population of potential borrowers.\textsuperscript{11} The traditional model to describe sample selection problems is the tobit II model\textsuperscript{12}, which is typically estimated using a two-step procedure introduced by Heckman (1979).

The two-step estimation involves first estimating a probit model of the selection equation using the full sample where the dependent variable indicates whether the observation is selected or not. The results of the probit model are then used to calculate Heckman’s lambda, also known as the inverse Mill’s ratio, which captures the sample selection bias. Heckman’s lambda is calculated as $\phi(x_i' \beta)/\Phi(x_i' \beta)$, where $x_i$ indicates the vector of exogenous characteristics that are used in the probit model to describe whether observation $i$ is selected or not, with regression coefficients $\beta$. The second stage involves estimating a simple OLS regression using the restricted sample with Heckman’s lambda added to the original regression specification. The regression coefficient of Heckman’s lambda measures the covariance of the error terms from the original regression equation and the selection equation. It is then possible to test the null

\textsuperscript{10} Russia experienced hyperinflation in 1992. During 1992, the CPI index increased by 2,510 percent and the PPI index even by 3,278 percent. The inflation rate decreased subsequently to 840 percent per annum in 1993 and 215 percent in 1994 (Source: Goskomstat).

\textsuperscript{11} The sample of firms (out of the total number of 439 firms surveyed) that have information on loan size is naturally constrained to borrowing firms.

\textsuperscript{12} This classification of tobit models is due to Amemiya (1984).
hypothesis of no sample selection bias using a standard t-test on the regression coefficient of Heckman's lambda.

We use Heckman's two-step procedure to estimate the effect of bank ownership on loan size. As dependent variable of the first-step selection equation we use a dummy variable that takes value of one if the firm has borrowed loans from banks, and zero if the firm is not a borrower. The sample used for estimation of the selection equation includes all firms that indicated whether they are borrowers or not, which amounts to a sample of 232 firms out of the total number of 439 firms surveyed. As non-borrower specific, explanatory variables we include profits to sales, a private ownership dummy variable, and industry dummies. These variables are thought to affect the likelihood of being a borrower. We estimate the selection equation using a probit model, and use its regression output to calculate Heckman's lambda. The estimation results of the selection model are presented in Table 1.3.a. We find that private firms are more likely to be borrowers, although the power of the regression is weak. In fact, a likelihood model specification test rejects the model at a 45% level. This suggests that the sample of borrowers does not suffer from a major selection bias.\(^\text{13}\)

As a second-step we add the lambda variable to the original regression model to explain loan size. We estimate the second-stage regression by OLS using data on both state enterprises, privatised firms and private firms. The sample of borrowers used in the second-stage regression is 51, because, although 185 firms of the total of 439 firms surveyed are borrowers, 134 of these 185 firms did not report the size of their largest loan. Information on loan collateral is missing as well for a large number of borrowing firms. The standard errors are adjusted to take into account heteroskedasticity and the estimation error in Heckman's lambda. The estimation results of the second-stage regression are presented in Table 1.3.b.

We find that companies that are a majority shareholder in the bank granting the largest loan obtain a significantly larger amount of credit. Given the previous result from Table 1.2 that there is no indication of the presence of relationship banking between Russian banks and their majority shareholders, this form of preferential lending can be interpreted as insider lending. This result is consistent with our model, where we showed

\(^{13}\) Alternatively, this may be an indication of omitted, but unobserved variables.
that majority shareholders are in a better position to bribe a bank manager to get loans on favourable terms at the expense of the minor shareholder. We also find that borrowers that are profitable, that did not have repayment problems, and that put up a lot of collateral find it easier to get large new loans. Apparently, such borrowers are thought to be more creditworthy. We do not find that large borrowers find it easier to get large new loans from the same bank. This finding is consistent with the previous result from Table 1.2 that relationship banking between banks and their main customers was unlikely to be prevalent in Russia around 1994.

The t-statistic on the coefficient for the estimate of lambda indicates that there is no significant sample selection problem, although the implied correlation coefficient between the two equations' error terms is high at 0.37. The positive correlation coefficient indicates the existence of unobserved characteristics that positively affect the both decision to borrow and the size of the loan, but is apparently measured with so much error that it is not significantly different from zero. This finding is not surprising given the weak power of the first-step regression model in Table 1.3.a.
Table 1.3: Insider lending, loan size and interest rate in 1994 – tobit model

<table>
<thead>
<tr>
<th>Variable</th>
<th>(a) Bank borrower dummy</th>
<th>(b) Loan size</th>
<th>(c) Interest rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>***1.766</td>
<td>-.0096</td>
<td>***151.4</td>
</tr>
<tr>
<td></td>
<td>(3.988)</td>
<td>(0.0474)</td>
<td>(33.93)</td>
</tr>
<tr>
<td>Other credit</td>
<td>—</td>
<td>.1456</td>
<td>18.56</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.032)</td>
<td>(87.29)</td>
</tr>
<tr>
<td>Profit</td>
<td>.0078</td>
<td>* .0011</td>
<td>.0451</td>
</tr>
<tr>
<td></td>
<td>(0.0088)</td>
<td>(0.006)</td>
<td>(4.704)</td>
</tr>
<tr>
<td>Payment problems</td>
<td>—</td>
<td>***-.0529</td>
<td>*27.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0207)</td>
<td>(15.38)</td>
</tr>
<tr>
<td>Collateral</td>
<td>—</td>
<td>***.8602</td>
<td>.0261</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0550)</td>
<td>(0.0835)</td>
</tr>
<tr>
<td>Size</td>
<td>—</td>
<td>—</td>
<td>-.0056</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.0059)</td>
</tr>
<tr>
<td>Maturity</td>
<td>—</td>
<td>—</td>
<td>.2326</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(1.699)</td>
</tr>
<tr>
<td>Private ownership</td>
<td>*.6610</td>
<td>-.0266</td>
<td>8.840</td>
</tr>
<tr>
<td></td>
<td>(.3951)</td>
<td>(0.0363)</td>
<td>(25.87)</td>
</tr>
<tr>
<td>Bank ownership</td>
<td>—</td>
<td>**.0994</td>
<td>-4.314</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0472)</td>
<td>(34.20)</td>
</tr>
<tr>
<td>Lambda (Inverse Mills ratio)</td>
<td>—</td>
<td>0.0182</td>
<td>23.92</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0250)</td>
<td>(18.22)</td>
</tr>
<tr>
<td>Number of observations</td>
<td>232</td>
<td>51</td>
<td>51</td>
</tr>
<tr>
<td>χ²-statistic</td>
<td>14.96</td>
<td>775.3</td>
<td>10.60</td>
</tr>
<tr>
<td>p-value</td>
<td>.454</td>
<td>.000</td>
<td>.390</td>
</tr>
</tbody>
</table>

Notes: The dependent variable in column (a) is a dummy variable indicating whether the company has borrowed loans from a bank, or not. The dependent variable in column (b) is the size of the largest loan received from a commercial bank as of mid-1994 scaled by sales. The dependent variable in column (c) is the interest rate in % on the largest commercial bank loan as of mid-1994. Other credit is the amount of credit outstanding with banks as of mid-1994 excluding the largest commercial bank loan received as of mid-1994 and scaled by sales. Profit is the profit of the firm as a percentage of sales revenue as of mid-1994. Payment problems is a dummy variable that takes value one if the firm had repayment problems as of mid 1994, i.e. has failed in the past two years to repay a bank loan or to make an interest payment on time, and zero otherwise. Collateral is the value of the collateral of the largest loan as of mid-1994 scaled by sales in (b) and as a % of the loan size in (c). Size is the size of the largest commercial bank loan in millions of rubles as of mid-1994. Maturity is the remaining maturity of the largest loan in months as of mid-1994. Private ownership is a dummy variable that takes value one if the company is private as of mid-1994, and zero otherwise. Bank ownership is a dummy variable that takes value one if the firm is a majority shareholder in the bank granting the largest loan as of mid-1994, and zero if the firm is not a shareholder or a minor shareholder. Industry dummies are included in model (a), but not reported. Model (a) is estimated as a probit model. Models (b) and (c) are estimated as a tobit II regression model using Heckman’s two-step method. The probit model in (a) is the first-stage regression for both (b) and (c). Heteroskedasticity robust standard errors are reported in parentheses. The χ²-statistic in (a) is a model specification test statistic and equals 2*(L₁-L₀) with L₁ the log-likelihood of the full model and L₀ the log-likelihood of a constant-only model. The χ²-statistic in (b) and (c) relates to a Wald test with null hypothesis that all coefficients equal zero. The sign * indicates significance at a 10% level, ** indicates significance at a 5% level, and *** indicates significance at a 1% level.
Next, we investigate whether shareholders pay lower interest rates. Once more, we need to control for a potential sample selection problem that may arise from focusing on the non-random sample of borrowing firms. Again, we estimate a tobit II model using the two-step procedure introduced by Heckman (1979) to control for the potential sample selection problem. The selection equation is identical to the one used in the previous analysis, and the probit estimation results can be found in Table 1.3.a. The sample of borrowers used in the second-stage regression is 51, because, although 83 firms reported the interest rate on their largest loan, only 51 firms reported the size of their largest loan.

The second-stage regression specifies the interest rate on the largest bank loan as a function of the size of the loan, the collateral of the loan, profits to sales, payment problems during the last two years, the amount of other credit outstanding, the maturity of the loan, a private ownership dummy, a dummy variables that indicates whether the firm is a majority shareholder in the bank granting the loan, and Heckman’s lambda to control for potential sample selection bias. We include the first six variables to control for the risk of the loan. Only for the first four variables we have an a priori expectation of the sign of the relationship with the interest rate. An increase in collateral or profits to sales, as well as a decrease in the loan size is expected to improve the repayment capacity of the firm, and hence to decrease the interest rate that the bank would charge. On the other hand, past loan repayment problems are expected to be a good predictor of current payment problems, and are therefore likely to raise the interest rate charged by the bank. The sign of the relationship between the interest rate on the largest loan and the amount of other credit outstanding as well as the maturity of the loan is not so clear. In general, interest rates would be higher on loans with a longer maturity and for companies with a large amount of loans, because of the increased riskiness of the loan. However, in the case of Russia, where there is an overall shortage of credit, companies that are able to get a large amount of loans and/or loans at high maturity might be perceived to be less risky by the banks, which would support a lower interest rate.

We estimate the second-stage model using OLS and correct the standard errors for heteroskedasticity and estimation error in Heckman’s lambda. The estimation results are presented in Table 1.3.c. Since the riskiness of firms might differ across industries, leading banks to require different interest rates on loans for different industries, we have estimated the model with industry dummies as well. In both cases, we do not find any
evidence of an interest rate favour towards companies that own banks. The inclusion of industry dummies indicates that there are no significant industry-specific effects. We therefore only report the results based upon the model without industry dummies. We find weak evidence that firms with repayment problems during the last two years have to pay higher interest rates on new loans, although a Wald model specification test rejects the model at a 39% level.

From the above we conclude that Russian firms and banks engaged into insider lending banks on the basis of loan volume rather than interest rate level. The reason for this might be that it is easier to hide fraudulent lending behaviour towards outsiders if you juggle with the volume of a loan rather than with the interest rate, especially in an environment where it is difficult to assess the risk of a company. Another explanation for this result is that many insider loans might not get repaid, but are always rolled over. The interest rate on such a loan does not matter, since repayment does not take place. In credit constrained Russia it seems likely that insiders used their powers primarily to get large loans, and that the pricing of loans was secondary. The data provides empirical evidence for a relationship between non-repayment of loans and bank ownership: although many firms did not fully meet their loan payment obligations in the past two years (57% of total sample), non-repayment was significantly higher among firms that are shareholders of banks (71%).

1.4 Preventing Insider Lending

In countries with poor banking regulation and a poor legal framework, such as Russia, bankers can easily hide insider lending abuse from the regulator and the shareholders (i.e., the probability $\eta$ in the above model is low). Although most countries have regulations in place that try to prevent such lending practices (such as a restriction on the amount the bank can lend to one party or to insiders), this will only limit the amount of such bad lending practice, not prevent it, and might not be effective at all if it is easy for the bank to get around these restrictions without being “caught” by the regulator.

In this section, we propose two potential contracts to limit insider lending, namely, a penalty contract and an equity incentive scheme. The first contract would state that the regulator could impose a very high penalty on the bank manager in case insider lending is
detected. The second contract would provide the bank manager with a payoff that is linked to the value of the bank’s equity. With respect to the penalty contract we have the following proposition.

**Proposition 4:** The regulator can prevent insider lending by imposing a very high penalty on the bank manager, say $c$, if insider lending practices are discovered.

*Proof:* Let $c(\theta) = c(\theta - \hat{\theta})^2 / 2$ be the penalty the regulator imposes on the bank manager if insider lending is discovered with probability $\eta$, that is for deviating the project quality from the optimal level $\hat{\theta}$. The bank manager now maximizes $w + (1 - \eta)(1 - \psi)\theta[R(\theta) - R(\hat{\theta})] - \eta \epsilon(\theta - \hat{\theta})^2 / 2$. It follows that for $c$ large enough (for ease of exposition one can take $c \to \infty$) the bank manager will choose $\theta = \hat{\theta}$, that is, the bank manager does not engage into insider lending.

Proposition 4 uses well-known results from the incentive literature to show that there exists a penalty high enough that, if imposed on the bank manager, will prevent the bank manager from engaging in insider lending. The intuition of proposition 4 is that it is not worth for a bank manager to engage into insider lending if the punishment is extremely large, even if the chance of such a punishment occurring is low. Of course, the penalty solution presumes enforceability of the penalty contract.

In the following we will consider an equity incentive scheme for which the bank manager will maximise the value of the bank, and explore its effectiveness. An example of such a scheme in the above model would be $\xi \theta[R(\hat{\theta}) - (1 - K)\psi]$, with $\xi$ small. Such a scheme will lower the incentive problem that exists because of the separation of ownership (shareholders) and control (bank manager) by simply giving the one that is in control (the self-interested bank manager) an incentive to maximise the payoff of the owners (the bank shareholders). Since $\xi$ is small, this motivation is almost costless to the shareholders. Such incentive schemes have been well documented in the literature, for example in Hart (1993). The following proposition states the effect of an equity incentive scheme on insider lending as defined here.
Proposition 5: An equity incentive scheme will improve the quality of the insider loan, say to $\tilde{\delta}$, although it cannot prevent the quality of the insider loan being lower than the quality of a normal loan. In effect, this means that an equity incentive scheme can only limit, but not prevent insider lending.

Proof: If the regulator puts the bank manager on an equity incentive scheme that promises a share of $\xi$ of the value of the bank’s equity then the bribed bank manager maximises:

$$\max_{\theta} \omega + (1 - \eta)(1 - \psi)\theta[R(\theta) - R(\tilde{\theta})] +$$

$$+ \xi [E(\tilde{\gamma}) + (1 - \eta)(1 - \psi)\theta[R(\theta) - (1 - K)r'] + ((1 - \eta)\psi + \eta)\tilde{\theta}[R(\tilde{\theta}) - (1 - K)r']$$

the solution to which is

$$\tilde{\delta} = \frac{-R(\tilde{\delta}) + R(\tilde{\theta}) - \frac{\xi}{1 + \xi}[R(\tilde{\theta}) - (1 - K)r']}{R'(\tilde{\delta})}$$  \hspace{1cm} (1.8)

Without the equity incentive scheme, the bribed bank manager chooses $\tilde{\delta} = [-R(\tilde{\delta}) + R(\tilde{\theta})] / R'(\tilde{\theta})$. Since $R(\tilde{\theta}) > (1 - K)r'$ and $R'(\theta) < 0$ it follows that $\tilde{\delta} > \tilde{\theta}$. We can rewrite (1.8) as

$$\tilde{\delta} = \frac{-R(\tilde{\delta}) + (1 - K)r' + \frac{1}{1 + \xi}[R(\tilde{\theta}) - (1 - K)r']}{R'(\tilde{\delta})}$$  \hspace{1cm} (1.9)

Without insider lending the bank manager chooses $\tilde{\delta} = [-R(\tilde{\delta}) + (1 - K)r'] / R'(\tilde{\theta})$. Since $R(\tilde{\theta}) > (1 - K)r'$ and $R'(\theta) < 0$ it follows that $\tilde{\delta} < \tilde{\theta}$. It follows thus that $\hat{\theta} < \tilde{\delta} < \tilde{\theta}$ which means that an equity incentive scheme does not prevent insider lending, but that it does increase the quality of the insider loan. It thereby reduces the risk taking of the bank manager. \hspace{1cm} \Box

Whether insider lending can be mitigated more effectively by rewarding rather than penalising bank managers is a difficult question to answer. In the Russian environment the merits of penalties probably outweigh the merits of rewards. First, although the effectiveness of both instruments suffers from the poor enforcement of contracts in Russia, it is probably easier for the regulator to enforce the penalty contract than it is for the bank manager to enforce the equity incentive scheme because for the penalty contract to be enforceable it is sufficient to verify that the loan quality differs from the optimal level, while for the equity incentive scheme to be enforceable it is necessary to verify how much the loan quality differs from the optimal level. Also, the regulator being a government institution may have more power to enforce contracts. Second, the model shows that a penalty contract, if enforced, will prevent insider lending, while an equity
incentive scheme can at best mitigate insider lending. Third, share value may be determined by things other than managerial behaviour in Russia. In an environment in which bank share value is tied only loosely to managerial behaviour, an equity incentive scheme is less effective. Also, an equity incentive scheme is less effective if the bank makes losses, as follows from the following proposition. Of course, a penalty contract and an equity incentive scheme are not mutually exclusive contracts and may well be used as a package.

**Proposition 6:** An equity incentive scheme will be less effective in limiting insider lending if the bank is insolvent.

**Proof:** If the bank manager of an insolvent bank is put on an equity incentive scheme that gives a share of \( \xi \) of the bank’s equity, then the maximisation problem of a bribed bank manager becomes:

\[
\max_\theta \ w_0 + (1 - \eta)(1 - \psi)\theta[R(\theta) - R(\hat{\theta}^\gamma)] + \\
\xi \{(1 - \eta)(1 - \psi)\theta[E(\tilde{y}) + R(\theta) - (1 - K)r'] + ((1 - \eta)\psi + \eta)\hat{\gamma}\{E(\tilde{y}) + R(\hat{\theta}^\gamma) - (1 - K)r'\}\}
\]

the solution to which is

\[
\hat{\theta}_\xi^\gamma = \frac{-R(\hat{\theta}^\gamma) + \hat{\gamma}\{E(\tilde{y}) + R(\hat{\theta}^\gamma) - (1 - K)r'\}}{1 + \xi} / R'(\hat{\theta}^\gamma)
\] (1.10)

Without the equity incentive scheme, the bribed bank manager of an insolvent bank chooses\( \hat{\theta}^\gamma = \frac{-R(\hat{\theta}^\gamma) + R(\hat{\theta}^\gamma)}{R'(\hat{\theta}^\gamma)}. \) Since \( R(\hat{\theta}^\gamma) > -E(\tilde{y}) + (1 - K)r' \) and \( R'(\theta) < 0 \) it must be that\( \hat{\theta}_\xi^\gamma > \hat{\theta}^\gamma. \) It follows that putting the bank manager of an insolvent bank on an equity incentive scheme increases the quality of the insider loan, as is the case if the bank is solvent. We can rewrite (1.10) as

\[
\hat{\theta}_\xi^\gamma = \frac{-R(\hat{\theta}^\gamma) + (1 - K)r' - E(\tilde{y})}{1 + \xi} / R'(\hat{\theta}^\gamma)
\] (1.11)

Without insider lending the bank manager chooses\( \hat{\theta}^\gamma = \frac{-R(\hat{\theta}^\gamma) + (1 - K)r'}{R'(\hat{\theta}^\gamma)}. \) Since \( R(\hat{\theta}^\gamma) > -E(\tilde{y}) + (1 - K)r' \) and \( R'(\theta) < 0 \) it must be that\( \hat{\theta}_\xi^\gamma < \hat{\theta}^\gamma. \) If we rewrite (1.11) as

\[
\hat{\theta}_\xi^\gamma = \frac{-R(\hat{\theta}^\gamma) + (1 - K)r' - E(\tilde{y})}{1 + \xi} / R'(\hat{\theta}^\gamma)
\] (1.12)

then it follows from the fact that both\( E(\tilde{y}) < 0 \) and \( R'(\theta) < 0, \) that\( \hat{\theta}_\xi^\gamma < \hat{\theta}^\gamma, \) i.e. that the quality of an insider loan extended by a bank manager who is put on an equity incentive scheme will be lower if the bank is insolvent than if the bank is solvent.
1.5 New Developments since 1994

Since mid-1994, the time that the Russian enterprise survey was conducted, the ownership structure of Russian firms has changed dramatically. In addition to a decrease in the extent of government ownership of firms, an increasing number of firms has become controlled by financial institutions, including banks and investment funds. A particular new development has been the emergence of business groups that are dominated by a financial institution, the so-called Financial Industrial Group (FIG). This new corporate structure is characterised by a business group that includes a financial institution, a number of industrial firms, and often a holding company. The companies in these groups are tied together by cross-shareholdings, and the financial institution has a controlling stake in most member firms. These FIGs emerged from the privatisation process in 1993-95 when new Russian banks took major shareholdings in Russian industrial firms, mostly through loan-for share deals, while taking advantage of limited competition by capital market investors (see Perotti and Gelfer, 1999).

The emergence of bank-ownership of firms is confirmed by the results of a second survey of Russian enterprises conducted in 1997 by the World Bank and the Russian Academy of Sciences.14 This survey is similar in set-up to the 1994-survey and comprises a similar set of firms. Table 1.4 clearly shows that, when we compare the results of the 1997 survey with the 1994 survey, ownership of firms by financial institutions became more widespread during 1994-97, while ownership by managers was very common in both 1994 and 1997. The increasing importance of control by financial institutions is to a large extent related to the emergence of FIGs.15

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14 The survey is called “Russian Enterprises in the Market”. The information was collected through interviews with top management engaged in four different functions: General Director, Customer Relations, Supplier Relations, and Legal Relations. The survey has information on 330 enterprises and consists of both small and large firms. All 330 enterprises are Oblast firms from the following six regions: Barnaul, Moscow, Novosibirsk, Saratov, Ekaterinburg, and Voronezh.

15 While there were no FIGs in 1994, 22% of the sampled firms for the 1997 survey are members of a FIG, where FIGs are defined to include registered financial groups, unregistered financial groups, and business associations that include a bank.
Table 1.4: Ownership of Russian firms in 1994 and 1997

<table>
<thead>
<tr>
<th>Category of firms</th>
<th>Year 1994</th>
<th>Year 1997</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firms controlled by manager</td>
<td>17%</td>
<td>13%</td>
</tr>
<tr>
<td>Firms controlled by financial institution</td>
<td>0.5%</td>
<td>7%</td>
</tr>
<tr>
<td>Number of firms with ownership data</td>
<td>276</td>
<td>224</td>
</tr>
</tbody>
</table>

Notes: Managerial control is defined as managerial ownership of 50% or more of total shares. Similarly, we define a firm to be controlled by a financial institution if a financial institution owns 50% or more of the total shares of the firm. Financial institution comprises banks and investment funds. Total number of firms is 439 in 1994 and 328 in 1997.

The growing tendency for Russian banks to have controlling stakes in industrial firms may have changed the incentives for these banks to engage into insider lending. In general, it is expected that these banks are more likely to financially support the industrial firms that they control, especially if these industrial firms belong to the same FIG. The results of the 1997 survey indeed suggest that FIG-member firms receive more support from banks. FIG-member firms are both more likely to receive subsidised bank loans and debt relief from banks.\(^\text{16}\) This evidence implies however no causality. Whether the extent of insider lending in Russia has increased or not with the emergence of FIGs is ultimately an empirical question that we are unable to investigate due to the lack of data.\(^\text{17}\)

1.6 Conclusions

The freedom to set up and own banks during the early stage of financial reform in the early 1990s has resulted in extensive enterprise ownership of banks in Russia. Observers have argued that such ownership concentration has perpetuated insider lending. To increase our understanding of the situation in Russia at the time we develop a model of insider lending in which a borrower provides incentives to a bank manager to misuse his right of control by extending a loan at favourable rates at the expense of the equity value of the bank. This model helps to explain why we often observe that insider loans occur to borrowing firms that are also large shareholders of the bank. The reason is that, although in principle every borrower could bribe the bank manager for insider loans, large

\(^{16}\) Although only 22% of the sampled firms are member of a FIG, 40% of the firms that received bank loans at below-market rates of interest were FIG-member firms, and 33% of the firms that received debt relief due to formal or informal arrangements with bank officials were FIG-member firms.

\(^{17}\) Unfortunately, the 1997 survey does not include those questions from the 1994 survey that we have used to investigate the presence of insider lending in 1994.
shareholders have the power to fire the bank manager, and will use this power if the bank manager extends insider loans to others. Therefore, a bank manager favours large shareholders at the expense of minority shareholders, whose equity in the bank decreases in value, and the depositors, because of the increased possibility that the bank will fail.

To support the model we have looked at the relationships between Russian firms and banks using a World Bank survey conducted in mid-1994. We have found evidence that Russian firms and banks engaged into insider lending on the basis of loan volume. Although we find that firms that are majority shareholders of banks get loans on preferential terms with respect to loan volume, we did not find any sign of insider lending on the basis of interest rate levels. The reason for this might be that it is easier to hide fraudulent lending behaviour towards outsiders if you juggle with the volume of a loan rather than with the interest rate.

In Russia, it is possible for industrial firms to own bank shares and for entrepreneurs to sit on the management board of banks. The model shows that such shareholders on the management board of the bank need only give a relatively small bribe to the bank manager to make him give insider loans to the companies that the shareholders own, because they can threaten to fire the bank manager. An obvious question is why Russia has allowed those large shareholders with outside control of large firms on the management board of banks in the first place. The bank regulator could prevent the involvement of such shareholders in insider lending practices simply by forbidding shareholders with outside links to be on the management board of banks. Besides political reasons, one good reason for allowing those shareholders on the management board of banks is that these shareholders might have superior knowledge on particular industries which makes the monitoring of normal loans more efficient. In our model it could be that the shareholders can help the bank manager to assess the loan quality \( \theta \). Hence, the regulator has to make a trade-off between having more experience on board or more insider lending.

Although Russia has some regulations in place to limit the exposures of banks to related parties, those rules have remained largely ineffective, because regulators have been unable to enforce such rules, either because of lack of information or imprudent
behaviour. In section 1.4 we have proposed to limit insider lending by either penalising bank managers if it is discovered that they have engaged in such form of malpractice, or by putting all bank managers on an equity incentive scheme. The advantages of both proposals are that they are relatively cheap and easy to implement. We do, however, acknowledge that such instruments may not be completely effective in countries like Russia, where the enforcement of contracts is poor and where managerial behaviour may not be strongly linked to the value of shares.

Although we have made a first attempt to model insider lending, more research in this area is needed. One area for further research is to evaluate the benefits and costs of cross-ownership. On the one hand, cross-ownership raises the potential for relationship banking which allows to save on monitoring costs. On the other hand, cross-ownership gives rise to a conflict of interest between the parties in control of the bank and the outside investors and depositors of the bank, and promotes insider lending. Another area for further research is to identify instruments to prevent insider lending, in particular for countries like Russia that have a weak institutional framework.

The results in this paper are not unique to Russia but can be generalised to other countries with poor corporate governance and weak enforcement of regulations and laws. They improve our understanding of the reasons for the existence of extensive insider lending in such countries and of the challenges that these countries face in preventing insider lending. Bank regulation to limit the exposure of banks to related parties is not sufficient. Bank managers and regulators should be given incentives to limit imprudent behaviour, public information on firms and banks should become widely available at low cost, minority shareholder rights should be protected, and the enforceability of contracts should be improved.

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18 Gorton and Winton (1998) state that, although restrictions on bank’s exposures to a single borrower may have been adopted according to Basle Accords, the adoption of these standards has not been the same as enforcement.