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Department of Economics and Applied Economics

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The genesis of a commercial banking system in Russia and its role in the transition to a market economy in 1992-1994

Dissertation submitted in fulfilment of the degree of
Ph.D. in Economics

by

Koen Schoors

Promotor

Prof. dr. Hugo De Maegd

Abstract

This dissertation is the first analysis of Russian banks in the period 1992-1994 that is based on empirical analysis of bank data.

In chapter I we describe the data that are used in this work, namely a database of balance sheets and profit and loss accounts of Russian commercial banks in 1992-1994. Chapter II provides a short historical account of pre-92 developments in the Russian banking system. We show how Russian commercial banking was already rooted in Russian society before the collapse of the Soviet Union. Chapter III focuses on bank liabilities. The two central issues are the capitalisation of Russian banking system and the ability of Russian banks to collect savings from the population. Chapter IV analyses the development of the payments system in detail. Chapter V concentrates on bank assets. The main issues are required reserves, excess reserves and the role of banks in the allocation of credit to the economy. Chapter VI turns to the efficiency of intermediation and the size of the intermediation spread. We build a simulation model that explains why interest spreads are so high. In chapter VII we turn our attention to the role of Russian banks in corporate governance.

Summarising analytical results, we found that, notwithstanding the amazingly fast and strong development of the Russian banking sector, banks did fail to fulfil the basic functions of commercial banks in a developed market economy and had only a limited impact on the transition process. Banks did not succeed to collect savings of the population, were inefficient payment settlers and allocated loans in an inefficient way. Furthermore, interest spreads were too high and banks' involvement in corporate control was at best limited. This was not due to the shock therapy of Russian transition, but rather to the lack of shock therapy. The large flow of centralised credit resources, the soft monetary policy of the CBR, the deficient bank supervision and control, the absence of effective bankruptcy procedures and of an explicit deposit insurance system all contributed to the failure of banks to fulfil their role. A lot of historic opportunities were missed. This is expected to have adverse consequences far into the future, as demonstrated by the crisis in the summer of 1998.

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Acknowledgments

Before I started to write this thesis in 1991, I had already gathered quite some information on the communist system and the special function of banks within this system. And then, while I was serving in the Belgian army, everything changed. I threw away my information and started all over again, trying to find the line along which Russian commercial banks were developing.

In the process I received help and support from many people. I wish to thank my promotor, professor dr. De Maegd for giving me the opportunity to study the Russian economy and culture and for his unconditional support during the writing of this thesis. I am grateful to Peter Joos for alerting me that I could apply for a grant from the National Fund for Scientific Research, which I indeed received, but unfortunately to his disadvantage. Happily he did fine without. The financial support of the National Fund for Scientific Research was gratefully accepted. I also thank Daniel Gros for teaching me how to think straight and giving me the opportunity to participate in a number of TACIS-projects. I have to mention the many friendly Russians too. Among them, special thanks go to Igor and Mr. Wittenberg, for giving me access to their data bases. Off course I am very grateful to all my friends and colleagues at the university of Ghent for their support and interest in what I was doing, with a special word of thank for Rudi Vander Vennet for having borne my 'brain storms' for so long. All the support of personal friends and relatives was also most welcome.

I also wish to thank my computer, who never let me down during so many nights, until he was -to my despair- stolen in the summer of 1997. I hope he is alive and well.

Last but not least, I want to thank Sandra for her love and support, my son Ivan for making me smile in the darkest moments, and my unborn daughter for softly kicking me in the back at night.

Koen Schoors
Ghent, 19 January 1998

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Chapter 0. Introduction

In December 1991 the Soviet Union collapsed. One of the important causes of the collapse was the stagnation of the Soviet economic system. Soviet leaders knew very well the bad state of their economic system and Gorbachev, the last Soviet leader, devoted a lot of his attention and effort to the problem. The five years before the collapse were marked by a wave of economic reforms, baptised 'perestroika' by Gorbachev himself. 'Glasnost', which literally means openness or clearness, complemented perestroika. Glasnost without any doubt created more freedom, openness and democracy in the Soviet society. In the late eighties Gorbachev was still convinced that his beloved socialist system was inherently superior to capitalism and he was quite confident that the systemic reforms, perestroika and democratisation, would disclose the real potential of the socialist system and lead to its final and inevitable victory. Nobody at that stage could have imagined the fast implosion of the Soviet empire, the Soviet leaders least of all.

> *The people of the Soviet Union are convinced that perestroika and democratisation will result in a richer and stronger country. Life will become better. There are problems, sometimes very serious ones, but there always will be, also on the way of perestroika, we don't conceal this. But we will overcome. We are sure about it.*
> ....
> *The success of perestroika will settle the historic dispute about which system is better in accordance with the interests of the people. When the Soviet Union will have got rid of phenomenons that arose in extreme circumstances, it will get a new and attractive image and will constitute the living proof of the advantages inherent to the socialist system. The ideals of socialism will get a new impulse from this.*
> ....
> *Let the West think that capitalism is the highest accomplishment of civilisation. They have the right to think so. We simply don't agree. And may history judge who is right.* (Gorbachev, 1987)

It is however clear that Gorbachev nor anybody else had a clear idea about the nature and the timing of the reforms that were needed. The various articles, books, reform plans and political proposals were all evidence of a weak understanding of the functioning of a market economy. The only thing that was clear from the beginning was that, from the point of view of the political authorities, perestroika was not a surrender to capitalism, but rather a deepening of the real 'Leninist' socialism, whatever this may mean. As a consequence the discussions about the preferred road of perestroika towards prosperity were disturbed by political sensitivities and taboos. For example Gorbachev kept stressing till the very end the importance of 'collective property' and 'de-state-isation' as alternatives for the prevalent state property, showing his reluctance to use concepts such as 'private property', 'free market' or even worse 'privatisation' in official documents. This political constraint placed a heavy burden on the success of perestroika. In a way political constraints keep hampering smooth restructuring up till now.

However, if we look back at this period, ignore planned or hoped for events and instead concentrate on facts, we observe that perestroika triggered a wave of market-directed reforms, that very quickly went out of control of the authorities. The first major break-through was the

law on state enterprises of 1987, that triggered a wave of legal reforms and de facto restructuring. The most essential element of this law was the limited freedom that was granted to state enterprises without granting the corresponding accountability nor responsibility, which created a huge moral hazard problem. Enterprises reacted non-socialist and even unsocially to the new situation by rent-seeking behaviour. This gave birth to a spontaneous, dynamic process of market-oriented reform, which came in serious conflict with all other aspects of Soviet society and finally resulted in the official demise of Soviet Union by end 1991[1]. The price liberalisation in January 1992 marked the second and biggest break-through in market oriented reform. Since then we have witnessed an impressive flow of market-building legislation, far-reaching liberalisation of economic life, mass privatisation, the creation of financial markets and institutions and the establishment of market institutions. The point of no return has been reached some time ago. There certainly will be disputes about policy objectives, direction of reforms and for pure power during many years, but, whatever they say, even the most conservative Russian politicians realise and recognise that a return to the old centrally planned system is not feasible nor wanted.

There exists a huge literature on the causes of economic decline and the advisable policy for economic reform in Russia. I don't plan to overview this literature here. My interest is specifically in the financial system. The financial system in the former Soviet Union did not work properly. There exists an abundance of evidence for this statement. A lot of literature explains why, all contributions ending up in the same point: The financial system was inefficient because it was not a market system and the market can not be beaten or even satisfyingly imitated by a centrally planned system. In this work, I concentrate on a cornerstone of any market-based financial system, namely the banking system. How did the commercial banking system develop in Russia ? Did it fulfill its functions reasonably well? What was its role in the transition of the Russian economy to a market system in 1992-1994?

The literature can perfectly explain why markets are better than planning. However, describing what the optimal banking system looks like and why so, is far more complex. The economic theory on financial markets is weakly developed and contradictory. There is no unified theory that can explain the complete functioning of financial markets, but only a set of partial theories that shed light on specific aspects. However, banks are an established institute in every market economy, and arose independently in several regions of the world. Somehow banks must fulfill functions that cannot be properly dealt with by other market mechanisms or institutions. Below we mark the functions fulfilled by banks, which together constitute the rationale for their existence.

First, banks provide for consumption smoothing by supplying **stores of value** to consumers who wish to insure against uncertainty in their income flows, namely deposits with banks on bank accounts. These bank accounts have a second important function. They allow and facilitate the functioning of an efficient **payment system** for payments between bank account holders. The possibility of making payments in a cheap and fast manner is an often not recognised but crucial element of every well-functioning market infrastructure. Third, banks allocate loans to borrowers. These borrowers can be households, enterprises or the government. The efficiency of **loan allocation** is centrally important for an emerging market economy like Russia because it is one of the clues to successful restructuring. Fourth, banks are special because they perform the three previous tasks together like a vertically integrated firm, with

the deposits as primary products, payment system as an intermediate product and credits in the role of final product. This means that banks perform **intermediation between savings and investments**. They do so because there are economies of scale and scope and large synergies between the three 'product lines'. First, there is a clear marketing advantage. Every customer of one of the product lines will, in case of vertical integration, be tempted to buy products from the other product lines too. Second, there are synergies between the different product lines. Having a bank account makes it possible to handle payments safely by transferring resources between different accounts. The handling of payments by banks gives them access to private information about payer and payee, which will prove useful for lending activity. Deposits provide the resources needed to finance lending activity. If the functions were performed by separate agents there would emerge agency costs for organising transfers of information and resources between them, while with integration these costs are internalised and largely diminished. Note that banks in the process of intermediation also transform the nature of funds, as regards their maturity, liquidity and risk. Last, monitoring and screening by banks may lead to involvement of banks in **corporate governance** of borrowers. Therefore bank intermediation may be a source of outside corporate governance, which is deficient in Russia. The need for proper governance of enterprises is indeed immense.

We believe that the first four functions constitute the rationale for the existence of banks in every market economy. The fifth function is not essential to banking as such, but appears in every economy where financial markets and markets for managerial competence are weakly developed, which implies that market discipline cannot offer a satisfying mechanism for corporate control. In Russia, with its immensely underdeveloped financial markets, the scope for corporate control by banks is therefore huge. All five functions may be essential to banking in Russia. Therefore these functions will be the red thread throughout this dissertation.

This work is structured as follows. In chapter I we describe the data that are used in this work. The most important data source is a database of balance sheets and profit and loss accounts of Russian commercial banks in 1992-1994. Chapter I describes how these data were collected, processed and structured into two samples that will be used in every chapter.

Chapter II provides a short historical account of pre-92 developments in the Russian banking system. It describes how Russian commercial banking was already rooted in Russian society before the collapse of the Soviet Union. Chapter III focuses on bank liabilities. The two central issues are the capitalisation of Russian banking system and the ability of Russian banks to collect savings from the population. Chapter IV analyses the development of the payments system in detail. Chapter V concentrates on bank assets. The main issues are required reserves, excess reserves and the role of banks in the allocation of credit to the economy. Chapter VI turns to the efficiency of intermediation and the size of the intermediation spread. We build a simulation model that explains why interest spreads are so high. In chapter VII we turn our attention to the role of Russian banks in corporate governance. Chapter VIII provides a summary and policy conclusions.

Notes of chapter 0

1. It is clear that the concrete cause of the demise of the Soviet Union is to be found in the power struggle between the Soviet centre and the freedom-seeking former republics. It was in the first place the rise of nationalism that led to the fall of the Soviet Union. One of the important elements of nationalism certainly was the desire for economic self-determination of the former republics. More concretely the strong desire for market-oriented reforms in Russia without centralist Soviet supervision was one of the strongest factors contributing to the demise of the Soviet Union. Note that this tendency is prolonged nowadays in the budgetary battle between Moscow and the regions of the Russian Federation.

Chapter I. Data description

Throughout this thesis we will make use of bank data. We think it useful to describe these data in this first chapter in order to avoid interpretation problems later on. The bank data are from bank accounts. We collected a considerable number of accounts of Russian banks for the years 1992, 1993 and 1994. In this chapter we describe how the accounts were selected and checked in order to construct two samples of bank data, namely sample A and sample B. The selection criteria are elaborated in section 1. Section 2 describes how the data were converted to comparable formats and placed in two samples (A and B). Section 3 introduces our concept of bank type and shows the structure of the samples according to the bank's type.

1. Selection criteria

1.1. General

- **Availability :** The first problem was to get access to bank data. To our knowledge there exist only two databases that gather all bank accounts in a consistent manner, namely the information base of the tax inspection and the information base of the CBR, both of which are top secret. Moreover, even these bases can be expected to be incomplete, since far from all banks fulfilled their information obligations. More specifically a lot of banks fail to report profit and loss accounts. Therefore we can't use the standard procedure of acquiring the population database and drawing samples from it, because such a database does not exist. Our approach was to assemble as much accounts as possible from different sources and then filter them according to the criteria described below.
- **Completeness :** From the accounts collected, we only used the banks for which we disposed of both the annual balance and the profit and loss account. We also needed to determine the type of the bank, since that is a cornerstone for this research. We skipped banks that showed no data on their profit and loss accounts or whose type was unidentifiable.
- **Time period :** Accounts should be comparable with each other with respect to the date of the account. We only use annual accounts closed at one out of three dates, namely 31/12/92, 31/12/93 and 31/12/94. Quarterly or half yearly accounts and annual accounts on other dates were excluded.
- **Internal consistency :** We perform tests on the correctness and consistency of each account. In practice we tested the validity of a number of accounting identities. In addition we checked some accounting entries to be different from zero. So for example must required reserves and statutory capital be different from zero. If this is not the case, something is wrong with the account concerned and it was skipped accordingly.
- **Operativeness :** The banks should be in function. We tested this by checking some ratios that describe the bank's structure. Banks that mainly have capital as their predominant liability or only have reserves at the CBR as an asset are clearly not operational or at least not operating as banks so far. The purpose of these checks is to exclude empty shells and facade banks that hide other operations.
- **Trustworthiness :** Banks that only have 'other assets', or only 'other income', can be expected to cheat on their reporting obligations or are not functioning as genuine banks and are excluded.

1.2. Availability, completeness and time period

In this section we describe the process of data collection more precisely.

One very important data source is a database delivered to me by **ABC Consulting**, one of the small information businesses that arose during transition. Their database was installed on my computer and contained information on more than 2500 banks, about all banks that existed at that time. For all banks the database showed the name, the date of registration with the CBR, the address and the phone/fax number. For the majority of banks the database showed extremely detailed information on assets and liabilities, but not always on consistent dates. Unfortunately the information on profit and loss accounts was less complete. We will refer to this source as source A.

A second source was **Intelbridge**. Intelbridge is a medium firm specialised in financial information. One of its basic activities is to collect information about commercial banks. Intelbridge publishes a **directory** of commercial banks, which contains detailed information on more than 1500 banks and turned out to be practical for determining the bank's type. We purchased their directory both in written form and as software in May 1995. At the occasion of my second visit to Intelbridge, in September 1995, the company was working on a new directory with the **financial accounts** of commercial banks. We could buy the accounts prior to publication, subject to a secrecy agreement on our part to not disclose any specific bank information. These accounts were on paper, in rough form, in several different formats and on different dates. This was due to the fact that their data collection was based on deliberate cooperation of the banks concerned and aimed at assembling the most recent data rather than comparable data. This source is referred to as source B, containing initially 261 bank accounts.

The last and most revealing source of bank data was our own **field-research**. In September 1995 - November 1995, we faxed requests for information to more than 200 bank directors. In these faxes, written in Russian, we explained our academic mission and promised not to disclose any confidential data. Reception of the faxes was checked and confirmed by personal phone calls. Nevertheless, we received only three answers, namely of Inkombank, International Financial Company and Promstroibank. From them we received very relevant information, and we were able to interview high officers of Inkombank and Promstroibank. Still we thought a response rate of 1.5% was quite disappointing. This very low response rate was probably due to the closed character of Russian banking and the widespread distrust in Russian society. Therefore, we decided to implement a second action plan and personally went to a number of bank headquarters or their Moscow branches and tried to receive their accounts[1]. We succeeded to collect information on the accounts of 30 banks. 20 of them were Moscow-based top-100 banks, which were not in sample A nor B. The banks were chosen to enhance the representativeness of the sample. We refer to these accounts as source C.

After checking the compliance of the data with our completeness criterion, in the sense that we required their balance, profit and loss account and type, and after checking whether the time period of the data complied with our time criterion to only accept annual accounts of 31/12/92, 31/12/93 and 31/12/94, we kept 154 banks from source A, 115 accounts from source B and 25 accounts from source C.

1.3. Internal consistency

We performed several tests on the correctness and consistency of each account. First we tested a number of accounting identities :

- $\sum$ items of a category   = subtotal
- $\sum$ subtotals   = total
- $\sum$ liabilities   = $\sum$ assets
- $\sum$ revenues - $\sum$ costs   = profit

Then we tested whether some accounting entries were different from zero :

- statutory capital > 0
- reserves at the CBR > 0

If an account does fail one of these tests, something is badly wrong with the account concerned. Such accounts were left out of the sample.

1.4. Operativeness

The banks should be functioning. We tested this by checking some structural ratio's :

- equity/total assets ≤ 0.6
- reserves at the CBR/total assets ≤ 0.6
- fixed assets/total assets ≤ 0.6
- total deposits/total assets > 0
- total credits/total assets > 0

Banks that do not comply with these criteria are not operational or are at least not operating as banks. These banks are excluded from the samples. In this way we avoid empty shell banks and facade banks that hide operations other than banking.

1.5. Trustworthiness and accuracy

Some accounts look so strange, one can doubt their trustworthiness and accuracy :

- other assets/total assets ≤ 0.6
- other revenues/total revenues ≤ 0.6
- other costs/total costs ≤ 0.6

Banks that do not comply with these criteria can be expected to cheat on their reporting obligations or are not functioning as genuine banks and are excluded.

1.6. Selected banks

After having performed these corrections, and leaving out overlapping accounts we kept the samples described in table I.1. By end 1994, about 2500 banks were registered in Russia (see chapter II), of which about 1500 should be considered as genuine banks. Since we selected only banks that can be considered as genuine banks, sample A(1994) represents about 10.5% of the bank population, while sample B represents about 15.3% of the bank population.

2. Conversion of the data into comparable formats

The accounts must be in the same format or complementary formats that can be translated to a common basic format.

Unfortunately our different sources supplied accounts in different formats. Source A delivered very detailed information. The information was not really in a format but simply reported all the accounts and sub-accounts of bookkeeping. The information was aggregated to an interpretable balance and profit and loss account according to the rules established by the instruction of the CBR on the establishment of a common financial accounting system for commercial banks of August 1993[2]. The information in these accounts is far more detailed than one could reasonably expect to receive from any Western bank.

In December 1994 the CBR issued a letter that established a common format for commercial banks to fulfil their publication obligations[3]. This format for obligatory publication offered a balance and a profit and loss account that was far more condense than the format for internal financial accounting. Unfortunately source B and C were mostly in this more condense format. We could translate source A in the format of source B and C, but the opposite transformation was not feasible. By transforming A to the condense format of B and C, a lot of information would be lost.

Therefore we thought it useful to construct two samples. Sample A is in the most detailed format and only contains data from source A. Sample B contains accounts from sources A, B and C and is in the more condense format, instructed as the official publication format by the CBR in December 1994. This sample has a lower information value but its size is larger and it representativeness is automatically better. The transformation from source A-data to the sample B-format was accomplished according to the method proposed by Androsov (1995). Table I.1. shows the composition of both samples according to the data sources used.

Some accounts turned out to be in a format sui generis or in a format that could not satisfyingly be translated in the format of the majority of the accounts. These accounts may supply interesting and interpretable information about the banks concerned, but they cannot be compared with the other accounts. Therefore these accounts were skipped.

Table I.1. Description of the samples according to data sources

Sample	Source A	Source B	Source C	Total
A(1994)	126	-	-	126
A(1993)	60	-	-	60
A(1992)	44	-	-	44
B(1994)	126	84	20	230

3. The type of the bank

3.1. A classification of banks

Banks were classified according to three criteria: Is the bank Moscow-based or not, is the bank local, or rather a regional or even national player, and is the bank a former state bank or not?

The operational definitions of these criteria are :

Moscow- based banks : These are banks with the official address of headquarters in Moscow according to the register of the CBR. This category is important because Moscow developed into the financial capital of the country and has therefore special characteristics.

National banks : These are banks with branches in at least three Russian regions, the Central Moscow region excluded. Their scale and scope of operation might give them some competitive advantage over the others.

Regional banks : These are banks with at least five branches in a particular region. They are large in their region, but often not important outside it.

State banks : In Russia these banks are commonly referred to as banks founded on the basis of one of the former specialised banks (see chapter II). These banks are not genuine state banks but rather the successors of a branch, a local department, a regional department or a sectoral department of one of the formerly state-owned banks. They were in a large part founded in the process of decentralised spontaneous privatisation of 1990-1992 (see chapter II). For convenience we will refer to these banks as state banks or former state banks. But we have to keep in mind that they are in fact private banks founded on the basis of former state-owned specialised banks and that they often have retained good connections with the state.

The directory of Intelbridge was the main data source for the classification of banks. In practice we will mainly use three dummy variables to control the bank's type, namely MOSCOW, STATE, and NATREG. Their interpretation is obvious. The dummy for national and regional banks (NATREG) is at some occasions split into a dummy for national banks (NATIONAL) and a dummy for regional banks (REGIONAL).

3.2. Sample distribution according to the bank's type

It is interesting to know the composition of the samples with respect to bank type. The three criteria are not mutually exclusive. The combination of three dummy variables allows 8 different combinations, ranging from private, small, local banks (all dummies are 0) to Moscow-based large state banks (all dummies are 1). Figure I.1. gives an overview of the 8 different classes of banks and table I.2. gives the distribution of our sample according to these 8 classes. Comparing the distribution of our sample to the population distribution is difficult, because there is no detailed information on the population distribution. Nevertheless, the information revealed in chapter II, shows that the samples are quite representative.

Figure I.1. The classification of banks according to three criteria
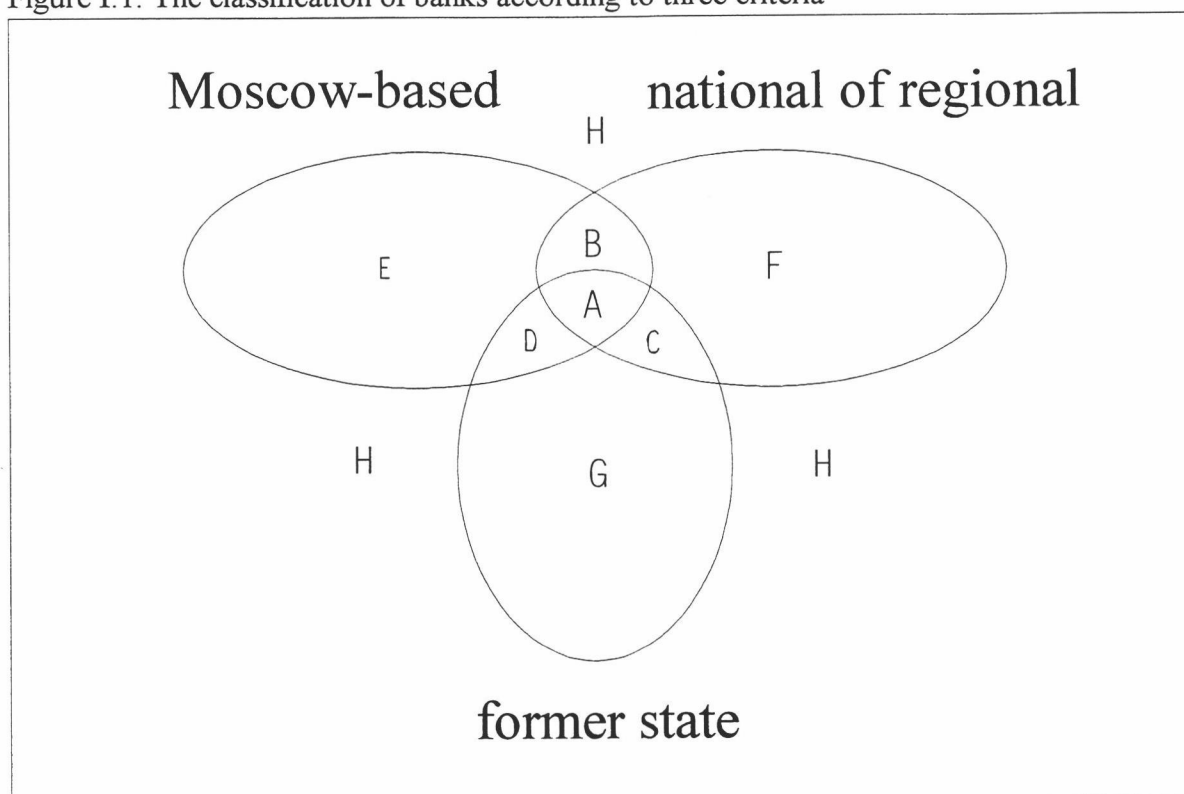
former state banks   = A + C + D + G
Moscow-based banks   = A + B + D + E
national or regional banks = A + B + C + F
private, small, local banks = H

Table I.2. Sample distribution of sample A and sample B

| | Sample A | | | Sample B |
	1994	1993	1992	1994
A	3	2	2	7
B	6	1	1	20
C	21	12	12	27
D	3	1	1	4
E	23	10	4	93
F	9	2	1	11
G	26	15	14	25
H	35	17	9	43
former state banks	50	30	29	63
Moscow-based banks	35	14	8	124
national or regional banks	39	17	16	65
private small local banks	35	17	9	43
Total	126	60	44	230

The choice of the three dummy variables is easily explained. Moscow has developed into the financial capital of Russia. Moscow hosts all important financial markets of Russia and counts an enormous number of commercial banks. Liquidity, efficiency and competition are all higher in Moscow. It is most likely that this will affect bank balances and profit and loss accounts.

State banks have inherited a branch network from their communist predecessors. They have good connections with the state and with the old state enterprises, which can be both a blessing and a burden. They may have a reputation of trustworthiness with savers. They also have experienced staff. Badly enough this experience may grow counterproductive within the framework of the changing roles of banks in the transition to a market economy. It is not unlikely that these factors may have an effect on bank structure and bank performance, which shows in their balance and profit and loss account.

National or regional banks are larger and better diversified than other banks. They are likely to differ from other banks also for a lot of other reasons, as will be shown in this work.

The use of bank balances in empirical research on Russian banks in the period 1992-1994 and the classification of banks according to the three criteria are both new in the literature. As far as we know nobody has been able to collect these data for research before.

4. Observations and interviews

During the field research, I entered a large number of banks (more than fifty) which enabled me to make some privileged observations[4]. In addition, I was able to interview a number of bank officers and central bank officers, the most important ones of which were Velisava T. Sevruk (Chief of Division of Statistics of the Central bank of Russia), Sergei J. Zatsepilov (Director of Public Relations of Inkombank), Elena N. Kondatriuk (Head accountant of Promstroibank), Michael I. Lyalkov (Chief Economist of the economic department of Sberbank), Sergei B. Khavin (Vice President of the Moscow Portfolio Investment Department of Mosbusinessbank), and last but not least T. Paramonova (former president of the CBR). Besides these persons, we have been talking to an endless number of officers and directors of smaller and less well-known banks. This large number of personal contacts gave me the opportunity to get a very realistic idea of how Russian banks were operating in practice.

Notes of chapter I

1. More precisely, I invented the story of being the young representative of a Western trade firm that wanted to open a valuta account in a Russian bank. As a matter of fact I even invented a name of a firm and to make it look more realistic I had a business card printed. Armed with only stories and persistence, I tried to enter as many banks as possible and used some more stories to receive their accounts. Indeed 'only in August 1995 there had been a severe crisis in the Russian interbank market and my firm needed some kind of guarantee that the bank of our choice was secure'. This trick worked fine in most cases. The real difficulty was physically entering these banks and getting access to a person who was entitled to deal with this kind of requests. My attempts to enter were not always successful, and went from not even passing the first guard ("we don't work with clients"?) to being invited to have coffee with the director and anything in between. In many a bank I created a stir by being the first non-Russian asking to open a valuta account. The trustworthiness of the data was controlled by comparing the balance sheet totals to the totals provided by source A. All accounts matched precisely, except for one, which was skipped accordingly.

2. Instruction of the CBR, No. 17, 24 August 1993 with addenda No. 1 and No. 2.

3. Letter of the CBR, No. 132, 22 December 1994.

4. A number of observations followed from the field research:

1) The number of women active in banking is amazingly high, at first sight higher than the number of men.
2) Most banks are not used to, nor equipped for nor trying to deal with individual customers.
3) Many banks try their best to stay hidden for the outside world. Often it was very hard to find a certain bank, even though I had its official address.
4) Judging to the omnipresence of surveillance, banking is not a safe job in Russia. That many kalashnikovs, metal detectors and tough-eying guards, I hope never to see in my life again.
5) A majority of banks is incredibly small and was in severe problems after the interbank crisis of August 1995.

Chapter II. A short story about history

1. The financial system before the perestroika

From April 1959 till the end of 1987/beginning of 1988, the financial system in the Soviet Union (SU) remained fundamentally unchanged. The genesis and the functioning of the Soviet financial system are described clearly in Kushpeta (1974). I will not redo Kushpeta's work. Therefore my description of the old system will be short and the focus will be on its major shortcomings.

1.1. The general framework

The financial system of the SU was fully determined by the system of central planning. Production, distribution and use of all goods, services and resources were centrally planned. The state-owned enterprises and institutions were not allowed to establish an independent cash-management or credit-management. They could not use their money on accounts with the monobank, except for goals that were centrally planned. Therefore, financial flows are merely the financial representation of centrally-planned activities. Within such an environment financial institutions clearly fulfil another role than in a market environment. Financial institutions have no independence whatsoever from the state and their employees are considered as state personnel. Their strategic goal is to carry out the financial aspects of the central plan. Towards enterprises they are instruments of control that monitor the fulfilment of the central plan by enterprises. The financial plan of a firm is merely the financial counterpart of a physical input-output plan. Deviations from the plan signal deviations from the production plan. This way of using credit as an instrument of control over physical production is referred to as 'ruble control' (Gregory and Stuart, 1990). The financial institutions are allowed to extend 'credit' to the enterprises in their sector, but that credit was centrally planned and moreover bore low or no interest. Capital markets or money markets did not exist.

The fiscal system was implicit. This means that there was no explicit system of consumer taxes, income taxes or profit taxes that were known before they were due, nor a government institution that could force agents to pay these taxes. Government raised its income in a more implicit way by taxing away profit from enterprises with declared surpluses and subsidising enterprises with declared shortages. So tax rates were set arbitrarily and changed continuously. Mergelov (1987) for example mentions that "Minpribor (the ministry of machinery construction) that has been using the method of profit distribution by norms since around 1970 (for the sector as a whole), has not been able to secure the stability of the norms. ... Moreover, in the case of unstable norms, enterprises can plan neither their production nor social development, not even for the near future, because they can dispose of their financial resources for only one year." (Mergelov, 1987, p.11). In a way this can be considered as normal, since all means of production are officially state property. Deficits were automatically monetised by the central bank.

The economic agents bear very limited risks and have few responsibilities, as their single goal is to fulfil the plan. Risk for economic agents is always the consequence of a choice problem. But in the SU all important choices were made within the system of central planning. So on the level of the enterprise economic choice was extremely limited and risk was only a marginal problem. For instance capital investment decisions were the prerogative of the central state.

From 1965 on, self-financed investments were officially supported, but all means of production stayed property of the state. The same limited choice holds for other activities as sales, marketing, research and development, human resources, planning or finance.

The system of centralised planning and the implicit fiscal system impede responsible behaviour of economic agents and even the functioning of the incentive system in general and thus create a moral hazard problem. How can one expect responsible behaviour from an economic agent, if that agent cannot really influence the results of his activities and is not rewarded for good results. Doing better than the plan is of no use for the enterprises, because the government will react by taxing away profits and by raising production norms. Doing slightly worse than the plan on the contrary makes sense because bankruptcy and market discipline do not exist and excessive losses are covered by subsidies from the central budget. Actually, it may be a good strategy, to more or less fulfil the plan but declare to perform slightly worse. The firm can sell the difference between actual and announced production on the black market at lucrative prices and at the same time receive some kind of state support to cover the announced loss. The fact that losses are covered automatically is referred to by Kornai (1986) as the 'soft budget constraint'. These soft budgets can take several forms such as soft prices, soft credits or soft subsidies. This concept is now widely known and accepted to be one of the central problems of all centrally planned economies (CPE). Nove (1986) clearly describes the problem:

> "Losses, if any, would be covered in the last resort by subsidy to the enterprise, thereby weakening financial discipline and adversely affecting efficiency. This is a by-product of the full-employment constraint: bankruptcies do not happen, factories do not close" (Nove, 1986, p.307).

The only hard constraint faced by enterprises is coercion to fulfil the central plan, for example by means of credit sanctions by the financial system. Soviets hoped to solve this problem by introducing full 'khozraschot[1]', and in fact creating a hard budget constraint. This idea never really worked for reasons mentioned below.

So we may conclude that there are fundamentally no incentives for the economic agents to raise productivity or profitability. Enterprises are only encouraged to more or less fulfil the central plan. Moreover, the success of such a system depends on the firmness of the central plan. Suppose that the fiscal system does not change but the coercion of central planning becomes weaker as was for example the case after the death of Stalin. As a consequence there will emerge adverse incentives to decrease performance, since such behaviour is rewarded by additional subsidies and not punished any more by the weakened central planning. On the other hand raising productivity or profitability makes no sense as it is punished by higher taxes and higher performance norms in the future. In such a system enterprises can be analysed as if they were bureaucracies. The bureaucratic supply theory of Borcherding (1977) predicts that such bureaucracies will behave cost maximising or budget maximising. So the bureaucratic supplier will raise its costs till the total value for the consumers is equal to the total cost of production (the budget), in that way reducing consumer surplus. This explains the persistence of typical CPE problems such as excess personnel, excess inventories, waste, and slow productivity developments.

There was almost no legislation nor jurisdiction concerning free economic activity. Free entrepreneurship, free trade or any form of free market behaviour were all explicitly considered as criminal. Property rights were extremely limited and neither bankruptcy laws nor trade laws did exist. Commercial banking was not allowed and there were no regulations for banking activity.

1.2. The banking institutions

1.2.1. Gosbank (GB)

The GB combined the functions of central emission bank, cash centre of the country, credit centre (commercial bank) with a large network of thousands of agencies, clearing centre of the payments mechanism and controlling institution on plan fulfilment by the enterprises. GB was administratively subordinate to the board of ministers of the USSR and the Ministry of Finance of the USSR.

From the reform in 1922-1924 onwards, the GB became the central emission bank of the country. The GB and via the GB the central planning, had full power over the creation of money: Cash money was printed and distributed according to central plan imperatives. As a central bank it was also the lender of last resort for commercial banks till independent commercial banking was abolished in the reform of 1930-1932.

In 1963 the system of saving banks (sberkassy) was integrated in the monobank system. From that moment on the GB is the only cash centre in the country. All economic agents are obliged to deposit their excess cash holdings with GB. GB then reintroduces these cash rubles in the economy through supplying the wage funds that enterprises need to pay their workers. Cash shortages are solved by emitting additional cash. Budget deficits are also solved by the release of new cash (Gregory and Stuart, 1990).

After the credit reform in 1930-1932, GB became the credit and clearing centre in the SU. In its function as a commercial bank, GB had the monopoly of supplying short term credit to the enterprises to satisfy their needs for working capital according to central plan imperatives. GB also managed all accounts of individuals, enterprises and state organisations. The payment system is as a matter of fact extremely centralised. Creation of non-cash money by GB or by the Stroibank, which is in reality just a part of the centralised financial system, is fully determined by the plan. The banks were allowed to extend 'credit' to the enterprises in their sector, but that credit was centrally planned and moreover bore low or no interest. Therefore those 'credits' should not be called credits but budget allocations (Tanzi, 1992).

The GB also has the duty to control fulfilment of the central plan by the enterprises. We will not give an overview of the existing control procedures, since our major interest is the reform and not the former system. A precise description can be found in De Maegd (1972).

The branches of GB in the republics are fully dependent of the GB headquarters and thus of the central plan. They receive cash money directly from GB headquarters, for paying wages in the economy of the republic concerned. Non-cash credit extended by these republican branches of GB, is equally to be called budget allocation rather than credit.

Gosbank is an abbreviation for «государственный банк», which means state bank. It is the central institution of the so-called monobank-system.

1.2.2. Stroibank

The Stroibank was the major investment bank of the SU. It financed the major part of investments in physical capital. It was allowed to extend credit if and only if the corresponding investments were actually planned. As a matter of fact, it uses the planned investments to construct its own credit plans. It is officially independent from GB, but in practice it is just a department of the monobank. Stroibank is an abbreviation for «строительный банк», which means construction bank

1.2.3. Sberkassy

This is a network of saving banks that accept deposits, facilitate payments on the communal level, buy and sell government loans, pay interest on obligations and pensions, organise state lotteries, perform cash operations for the population and the organisations. The central function is to collect resources from the population to reinvest them in the state sector. This system was incorporated in the GB on 1st January 1963. Within GB the system has limited autonomy and functions according to the khosrashot-principle. Sberkassy is an abbreviation for «сберегательные кассы», which means saving banks.

1.2.4. Vneshtorgbank

The Vneshtorgbank was founded in 1922 as a joint enterprise and was in the old system responsible for credit and payment transactions with foreign countries. Its activities are supervised and controlled by the GB, which is finally responsible for transactions concerning foreign trade, tourism and so forth. Vneshtorg is an abbreviation for «внешняя торговля», which means foreign trade.

1.2.5. Banks abroad

The Russian state owns a number of banks abroad. They are mainly located in Europe, but also in the Middle East and eastern countries. They are usually joint ventures with as most important shareholders, the GB and the Vneshtorgbank. They are specialised in trade with capitalist countries and developing countries and in international trading of gold and currency.

1.2.6. Other institutions

At last there are some other minor institutions such as post-offices and lombards. As in most western countries, post-offices can be used as an alternative payments mechanism. A lot of local post-offices are at the same time offices of the saving bank system. The lombards function as pawnshops and are thus alternative institutions for the creation of consumer credit. They were reestablished after the revolution, in 1922. Their activities are strictly local and unimportant. They receive their funds from GB and are thus controlled by GB.

1.3. Important characteristics of the financial sector

Cash and non cash circulation are strictly separated (Kushpeta, 1974). Cash money and non-cash money (deposit money) cannot be considered as perfect substitutes. The state determines in what form payments are to be settled. For example wage payments are settled in cash, while interenterprise payments are settled in non-cash money. The state also forces enterprises to use their money in a predetermined way. They are obliged to comply with several norms with regard to wage funds, investment funds etc. Transfers of funds can only be made if they are needed for planned production. Enterprises can only withdraw cash from their accounts in order to pay planned wages. Deposits of enterprises on current accounts or time deposits cannot be freely used to make payments. In that sense ruble money holdings cannot be considered as freely disposable future purchasing power, and thus is not M2 money in the traditional sense of the word. Money holdings should be considered as the financial representation of the central plan and as a control instrument on plan fulfilment. There is no money market, no capital market and in general no financial market that can fulfil specific market functions. The ruble is fully non-convertible, except for centrally-planned purposes.

In principle interenterprise credits are not allowed, except for credit granted by suppliers that is necessary from a financial-technical point of view. In practice suppliers seem often to postpone the sending of an invoice or a bill of payment. When they have already realised their plan for the month they will typically postpone invoicing in order not to endanger realisation of the plan for the following month. Moreover, the payment system works rather slowly. So the existing credit granted by suppliers is a perverse consequence of the system, rather than a market phenomenon.

In origin credit was costless. There was no interest-compensation whatsoever and as a consequence credit should be considered as a budget allocation, as stated above. Moreover, investment was not always financed by credits. A lot of investments were financed directly from budgetary funds and thus capital was often distributed totally costless without any obligation to redeem or pay interest. This was changed by the Kosygin-reforms of 1965. These reforms introduced interest rates in the Soviet financial system. Investments were more and more financed by credits instead of subsidies and "self-financing" became more and more important (Kushpeta, 1974). However interest rates were very low (1.5% - 3%) and credits continued to be planned.

The combination of central planning and artificially low cost of capital induced major inefficiencies in the allocation of capital. Also Soviet economists recognised this problem (Fjodoren-ko, 1970, as cited by Kushpeta, p.59). There existed no incentives to use the allocated capital in a productive way, so nobody should be surprised by the dramatic overcapitalisation in some sectors or by the systematic tendency to stagnation of such a system. Moreover one can argue that the overcapitalisation is partially due to the lack of financial markets. Enterprises cannot invest their money in financial assets. They have the choice between putting it on an account with the Gosbank (which means giving it to the state), and investing their money in excessive stocks of raw materials, labour or physical capital. Therefore, excessive stocks can partially be considered as alternative portfolio investments caused by the inefficiency of the system with regard to allocation of capital.

There is also no monetary policy as such. Let us consider the Fisher-equation:

$$M\ V = P\ T$$

Then consider that the amount of money (M), the prices (P) and the material production (T) are planned and in principle fully determined by the system. Prices are in principle constant. In theory, the aim of the monetary policy is to change the volume of money-circulation (MxV) in function of the planned changes in real transactions (T). Since cash was exclusively used by enterprises to pay wages and by consumers to buy consumption goods, the problem reduces to find the equilibrium between production of consumer goods and wages paid, at minimal cost. In order to be cost-efficient, the official doctrine was to recycle all cash holdings as fast as possible in the centralised system. Maximising the circulation of cash or maximising the velocity of cash was one of the major goals in the regulation of cash circulation (Kushpeta, 1974). If the economic policy succeeds in equalising consumer production to money supply, one would expect velocity to remain constant or even diminish. Several authors have however analysed the evolution of velocity during the last thirty years and observed that it has been decreasing over the years.

This is to be explained as follows. During the last thirty years, inflationary pressures were built up indirectly. According to data of the Ministry of Finance, during the last thirty years (from 1960 on) the growth of cash money (and hence wages) was permanently higher than the growth of the net material product, with the exception of only two years (Gross and Steinherr, 1995). We can look at this problem in the following way: Cash is created when the cash-inflows in the payment system are lower than the cash-outflows. Cash-outflows are determined by wage payments. Cash-inflows are determined by payments made by individuals for the purchase of consumption goods or savings. If production of consumption goods is lower than the demand for consumption goods, the population will hold excess money holdings, in that way forcing the GB to create new cash money to pay for their wage funds. In any developed market economy such a permanent disequilibrium could lead to import of consumption goods or inflation. In the SU however, import of consumption goods was limited and open inflation was repressed by price controls. This repressed inflation became visible through the growing inconvertibility of money into goods (commodity inconvertibility), forced saving, and excess demand for consumer products. Excess demand was mirrored in longer queues in state shops and rising black market prices. This problem of disequilibrium between money and production in an environment of repressed inflation is commonly referred to as 'monetary overhang'.

The phenomenon of monetary overhang in the Soviet Union has been widely studied both theoretically and empirically. Important contributions in this field have been made by Cochrane and Ickes (1991), Carson (1992), Cottarelli and Blejer (1992a), Commander (1992), Desai and Estrin (1992), Acharya and Spagat (1993), Lin (1993), Caprio and Honohan (1993).
Empirical results are obtained by Cottarelli and Blejer (1992b), and by IMF and others (1991). Actually the Joint Study of IMF and others (1991) estimated that at the end of 1990, households' undesired money balances in the former SU amounted to about one third of their financial wealth. Below we will show that the dramatic developments in the government budget in 1991 must even have aggravated this situation in 1991. Anyway, the severe inflation shock in January 1992 made ultimately clear that monetary overhang must have been substantial in the former Soviet Union.

One of the sources of disequilibrium between wages paid and production of consumer products is the budget deficit. Budget deficits are automatically monetised by Gosbank (by releasing new cash funds). This did not directly lead to inflationary pressures because the budget deficit was kept low and republican governments were forced to keep budget deficits low. Budget deficits only became the major source of inflation since the late eighties. This can easily be seen from table II.1 on the next page

1.4. The payment system

This system is organised by the GB and by the GB alone. All transfers of funds are settled by the centralised GB-system as simple transfers between accounts held at various branches of GB. So we can consider the payment system as an intrabank settlement system, with no intervention of a market mechanism of any kind. A detailed overview of this issue can be found in Kushpeta (1974).

This payment mechanism worked fairly slow. First of all, the communication system was very backward. All payment documents were distributed through the mail system, which could take a lot of time because of the enormous distances within the USSR. Second, the parties in the financial process had no economic interest in higher settlement speed. Enterprises knew that all payments would finally arrive because they were state guaranteed. So there was no bad invoice problem. Moreover, temporal finance problems could easily be solved by means of costless credit. In general the soft budget constraint and the absence of real interest rates meant that money lost its usual time value and processing speed became unimportant. The banking system had no interest in processing speed because it was a monopolist. There was no competition between financial institutions and thus no incentive for quality improvement of financial services. Moreover, there was no pressure from the enterprises to improve the speed. On the contrary, since the banking system functioned as fiscal agent and cashier of the government, the banking system was even encouraged to slow payments down because that raises float money that could be used to finance the government budget.

We can conclude that the payment system was totally unprepared for market reforms. There is no know-how available, except for the know-how of the monobank system, and even that know-how is backward, both from a technological point of view and as compared to the requirements of a market-based system.

Table II.1. The genesis of budget deficits in the late eighties

Years	Russian Revenue (1)	Credit (2)	Corrected Revenue (3) = (1)-(2)	Expenditure (4)	Balance (5) = (3)-(4)	NMP (6)	Balance in % NMP (7) = (6)/(7)
1965	7102.3	0.2	102.1	101.6	0.5	193.5	0.26
1970	156.7	0.5	156.2	154.6	1.6	289	0.55
1975	218.8	0.6	218.2	214.5	3.7	363	1.02
1976	232.2	0.6	231.6	226.7	4.9	386	1.27
1977	247.8	0.6	247.2	242.8	4.4	406	1.08
1978	265.8	0.6	265.2	260.2	5	427	1.17
1979	281.5	0.7	280.8	276.4	4.4	441	1.00
1980	302.7	0.6	302.1	294.6	7.5	462	1.62
1981	320.6	0.4	320.2	309.8	10.4	487	2.14
1982	353.0	1.0	352.0	343.1	8.9	524	1.70
1983	357.9	1.0	356.9	354.3	2.6	548	0.47
1984	376.7	1.0	375.7	371.2	4.5	571	0.79
1985	390.6	18.0	372.6	386.5	-13.9	579	-2.40
1986	419.5	47.9	371.6	417.1	-45.5	587	-7.75
1987	435.5	57.1	378.4	430.9	-52.5	600	-8.75
1988	469.0	90.1	378.9	459.5	-80.5	631	-12.75
1989			401.9	482.6	-80.7	657	-12.28

These figures are based on Goskomstat-data (Центральное статистическое управление СССР, Народное Хозяйство СССР, Москва, Статистика, Statistical Yearbook of the Economy of the USSR). It is reasonable to claim that these data may not be comparable with western data. Fiscal accounting is accomplished according to quite different procedures (domestic government borrowing is considered as state revenue, e.g.) and net material product is different from gross national product. On the other hand these data reveal an important fact. Having corrected the revenue data for government borrowing and assuming that Soviet fiscal accounting procedures are consistent over time, we observe the genesis of fiscal deficit problems from 1985 on, QED.

2. First reforms under perestroika (1988-1990)

2.1. General framework

The initial reforms of the banking system under perestroika are based on some bottom-up spontaneous innovations and top-down legal reforms. As far as legal reforms are concerned, three laws should be mentioned.

- Law of USSR on State Enterprises (concerns) of 30 June 1987, in force from 1 January 1988, that increased the autonomy of state enterprises. All enterprises had to be self-financing and had to operate on the basis of "khosrashot" from 1 January 1988 on. This weakened the firmness of central planning and induced the state enterprises to found corporate banks.
- Decree n° 821 of the Central Committee of the CP and the Board of Ministers of the USSR on 17 July 1987, in force from 1 January 1988. The decree states that the function of GB partially moves from monobank to central bank with centralised emission responsibility. We will call this the new Gosbank (NGB). Moreover there is erected a plethora of specialised banks (SB) that take over the 'commercial' activities from the old Gosbank.
- Law of USSR in August 1988 on Cooperative Enterprises. Article 23 of that law defined the framework of the cooperative banks and stipulated them as institutions which provide financial resources needed for the development of the activities of cooperatives. (Fuchita, Osaki, Miwa, 1993)

Except for these important laws, the basic framework did not change much. The implicit fiscal system stayed in place. There was no important fundamental new legislation nor jurisdiction concerning trade laws, property rights, bankruptcy or commercial banking. The four major changes were the introduction of free entrepreneurship (laws on cooperative sector), the growing decision autonomy of economic agents (law on state enterprises), the emergence of a commercial banking system and the splitting of the monobank system. In other words, free economic activity emerges without the appropriate legal framework.

According to Decree n° 821, the monobank system was broken up. The NGB is limited to its function of central bank. The commercial banking functions are taken over by a number of newly founded specialised banks that are theoretically fully independent. These specialised banks were founded on 1 January 1988 (Fuchita, Osaki, Miwa, 1993). They are described in detail below. Those banks were in practice still strongly influenced by the NGB, mainly because the old GB structures were simply renamed and continued to exist. For this reason the hierarchy of the SB is filled with people from the old system, that react in the old way.

At the base we observe the creation of a commercial banking sector two years before the first banking legislation came into force. During 1988-1990, these new banks developed and struggled for life against the Soviet administrative machine. This sector grew together with its clients, the new cooperative enterprises.

The most important consequence of these changes is, from our point of view, the gradual weakening of the central planning system, mainly caused by two factors. Firstly the laws on cooperatives and state enterprises increase the decision autonomy of economic agents and

diminish the scope and relevance of central planning. Secondly the splitting up of the mono-bank in a NGB and SB, the genesis of an unplanned commercial banking sector and the resulting confusion, make control of the state banking system on central plan fulfilment far more troublesome.

The combination of on the one hand the unchanged discretionary and even confiscatory fiscal system and on the other hand the weakening central planning, urged cost-maximising behaviour from the side of the enterprises. The reforms in the state sector did not urge the state enterprises to raise productivity or profitability, in contradiction to what was expected by the reformers. On the contrary , the reforms induced growing inflationary pressure. First, lower production of consumption goods in combination with raising nominal wages ceteris paribus induced higher inflationary pressure. Moreover the lower performance of enterprises lowered government revenue, because the implicit tax base was eroded, and increased government expenditure (subsidies). This caused growing budget deficits that were monetised by the release of additional cash to pay state personnel. As a consequence inflationary pressure mounted. We conclude that the macroeconomic imbalances between the real and the financial sector grew with increasing speed.

Figure II.1. The fiscal war in the SU
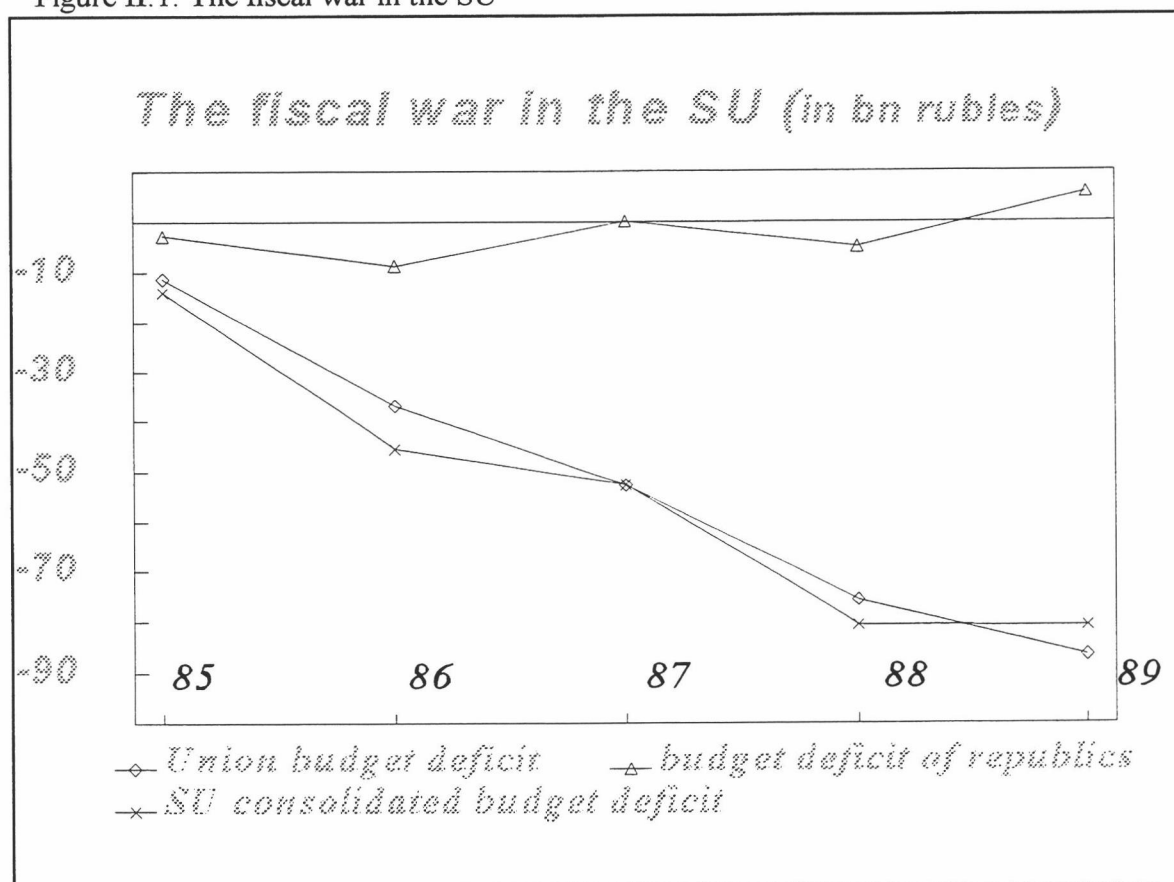
Moreover the budget deficits were distributed increasingly unequally between the central union government and the republican governments. Republican deficits seemed to stabilise at around zero, while the union deficit exploded (see figure II.1.).

Because of the power game between centre and republics in the second half of the eighties, the republics became more and more reluctant to pay their share to the union budget. This evolution seriously aggravated the budgetary problems on the level of the union as shown in tables II.2. and II.3. and figure II.2.

One could argue that the bad budgetary situation of the union, compared with the budget comfort of the republics, is due to excessive expenditure of the union government. But that can at best be considered only partially true. Over the first three years we observe that the share of union expenditure in total expenditure grows from 52.5 % to 55.1 %, which seems to confirm the hypothesis. But in 1989 the share of union expenditure in total expenditure falls to 50.6 %, so below the initial level of 1985. Indeed considering five years, the expenditures of the republican governments grew significantly faster than those of the union government (29.6 % versus 20.6 %). Nevertheless in 1989 the union budget problem is worse than ever, while republican budgets show a surplus.

So the main explanation of this problem, must be in the distribution of revenues between union and republics. In 1985 the union budget received 51.4 % of the revenues, compared with 48.6 % for the republics. In 1989 this is correspondingly 39.4 % and 60.6 %. So 12 % of revenues have been redirected from union to republics. The revenues of the union even fall with 17.5 % in nominal terms from 191.7 to 158.2, while republican revenues increase with 34.7 %, from 180.9 to 243.7.

We may conclude that the republics are reluctant to transfer their fiscal revenues to the union government. The power struggle between the central government and the republics caused a redirection of revenues. The huge budget deficits of the union government were partially due to higher fiscal independence of the republics.

We could not obtain reliable data for 1990-1991. Alexashenko (1993) analyses the collapse of the Soviet fiscal system for the period 1970-1991. He finds that overall budgetary revenues as a proportion of GNP decreased continuously from 1984 to 1991. This is consistent with our data in table II.2. and II.3. Alexashenko also shows that the 1991 decline in revenue is the steepest of all declines : In 1984 the revenue was at 49% of GNP, in 1990 it was at 41% and in 1991 at 35% of GNP¨. At the same time expenditure rose in % of GNP. He mentions that Russian officials estimated the overall budget deficit at 22% of GNP in 1991, all of which has been monetised. The monetary overhang that was created by this enormous increase of the money stock aggravated all symptoms of repressed inflation (forced savings, lines in state shops, rising black market prices etc.). In 1991 there was even an inflation outburst in April, when the government announced official price increases. All this shows that the Soviet economic system had completely collapsed and that the official disintegration of the Soviet Union was merely making official something that was already a fact.

Table II.2. The fiscal war between centre and republics (in bn rubles)

Years	Revenues			Expenditure			Budget Balance		
	USSR	Union	Republics	USSR	Union	Republics	USSR	Union	Republics
1985	372.6	191.7	180.9	386.5	202.9	183.6	-13.9	-11.2	-2.7
1986	371.6	186.0	185.6	417.1	222.9	194.2	-45.5	-36.9	-8.6
1987	378.4	184.9	193.5	430.9	237.5	193.4	-52.5	-52.6	0.1
1988	378.9	169.6	209.3	459.5	245.3	214.2	-80.6	-75.7	-4.9
1989	401.9	158.2	243.7	482.6	244.6	238.0	-80.7	-86.4	5.7

Source : Goskomstat, 1990, The National Economy in 1989

Table II.3. Shares in revenue and expenditure

Years	% of revenue		% of expenditure	
	Union	Republics	Union	Republics
1985	51.4 %	48.6 %	52.5 %	47.5 %
1986	50.0 %	50.0 %	53.4 %	46.6 %
1987	48.9 %	51.1 %	55.1 %	44.9 %
1988	44.8 %	55.2 %	53.4 %	46.6 %
1989	39.4 %	60.6 %	50.6 %	49.4 %

Source : calculations based on Goskomstat, 1990, The National Economy in 1989

We should note that a lot of Soviet economists foresaw the problems related with the reforms. The Soviet economic journal "Finansy"[2] for example focussed on the imminent law on state enterprises, that at that time was still a draft version. Most contributions showed a clear understanding of the major inconsistencies of the law, even before it came into power.

Pemrov mentions that the control on plan fulfilment was not clearly regulated. "In one case it is a higher organ, in another case it are financial-banking institutions and other supervising institutions, that are not higher organs." Further he mentions implicitly the moral hazard problem caused by the implicit fiscal system : "In article 13 is stipulated that, in the case enterprises are short of funds, payment of production (labour, services) will be secured on the account of centralised funds and reserves. Such an automatism of payments reduces the responsibility of enterprises for their own financial situation and is in contradiction with article 2, where is said that the state is not responsible for the obligations of enterprises" (Pemrov, 1987, p.68).

A lot of authors consider the problem from the point of view of the central budget and fear that more independent state enterprises will be reluctant to pay their obligations to the state. (Raevsky, 1987, p.65) (Khmelnitsky, 1987, p.66) (Poljak, 1987, p.68). Moskovsky and Tsherapakhin seem to be the only ones to understand that the enterprises could be reluctant to pay their taxes, because of the implicit fiscal system that arbitrarily taxes away their profits. "And at the same time this project of law does not contain any guarantee for the enterprises that the higher organs will not use a discretionary approach to determine the criteria for profit distribution[3]." (Moskovsky, 1987, p.70). Tsherapakhin seems to fear that the enterprises will in practice not gain much decision power. He mentions that the law uses the concept "state order", without clarifying explicitly its meaning. "If the concept means a usual directive order, this raises the question : Why using different terms for equivalent things ? If the concept "state order" can be understood as a new, promising instrument of plan realisation, a special kind of contract between enterprises and higher organs where both sides have mutual obligations ... ,then it should have been mentioned in the law" (Tsherapakhin, 1987, p.71).

Shtarev understands that the principles of self-financing and khosrashot for enterprises are not compatible with central planning and fixed price policy. He thinks to solve this incompatibility by adding : "In case of a loss, that lowers the khosrashot revenue of the enterprise, but which causes have nothing to do with the activity of the enterprise, the higher organ, ministry or department will correspondingly fund the losses" (Shtarev, 1987, p.69). Adding such a paragraph off course extremely reduces the responsibility of enterprises for their financial situation and shows therefore very well the conceptual inconsistency of the system. How can an economic agent be responsible for results or be "self-financing" if prices and production are planned or in other words if that agent has no control over the essential variables that determine his results.

So all problems, inherent in the law of July 1987, were known. Therefore the reform seems to be a "chronicle of an announced failure".

With regard to the reform of the banking system, it is clear that Soviet economists (or should we say economists approved by the system) at that time did not realise the huge problems they had to solve in the transformation of their financial system. A lot of economists considered the

reform of the banking system in 1988 an adaptation of the financial system to the new economic environment (khosrashot and self-finance) and certainly not as the first steps towards a two-tier banking system with central bank and commercial banking system. The monobank-system itself certainly did not support a development towards an independent commercial banking sector. In January 1988 Mr Garetovsky, at that time chairman of the board of Gosbank, says :"In the second stage of perestroika two important, interrelated, interdependent problems will be solved - further democratisation of society and the realisation of a radical reform of the direction of the economy, and here the most important thing is the completion/perfection of the banking system in the country, their style and their working methods, and the intensification of the influence of banks on the raising of the effectiveness of the economy, on the proceeding of fulfilment of the tasks of the plan for 1988" (Garetovsky, 1988, p. 5)

2.2. Banking institutions from 1988 on

2.2.1. New Gosbank (NGB)

Compared with GB, the NGB lost its commercial banking functions. All transactions amongst clients and banks were performed via the specialised state banks (SB) or the emerging commercial banking sector. So the NGB had only limited power over creation of non-cash money. As a consequence the central bank lost an important instrument to control the fulfilment of the plan by enterprises.

On the other hand the NGB stayed the central emission bank and the clearing centre of the country. As central emission bank NGB printed and distributes all cash money for the entire SU. As central clearing centre NGB organised all transfers of money between accounts in the specialised banks. This function was eroded by the genesis of the M.F.O-system between newly founded commercial banks (See chapter IV). NGB also stayed the cashier of the state budget, but the split off of the specialised banks made it far more difficult to carry out this task.

Moreover it became responsible for supervising, regulating and controlling the functioning of the specialised banks and later of the commercial banking sector. So the NGB gained supervisory functions. It also became lender of last resource for the commercial banking system, as it was before the reforms of 1930-1932.

One can remark here that the NGB remained the major shareholder in Sberbank and Promstroibank and thus conclude that the splitting up of the monobank did not really change the essentials of the monobank-system. This is partially true. The power of the NGB was indeed still considerable. Nevertheless history has shown that the splitting up of the monobank was a point of no return in the process of decentralisation of economic decision power. The NGB started its gradual shift from a monobank to a modern central bank. However till today the Central Bank of Russia (CBR) fulfils some commercial banking functions.

2.2.2. The central banks of the republics (cebareps)

The central banks of the republics (below referred to as cebareps) were in theory just republican branches on the NGB and received all cash money from the NGB. But in practice they tended to behave more and more independently. This became very clear during 1991. The independent behaviour of the cebareps made control on central plan fulfilment in the republics even more difficult than in Russia. So republican enterprises were likely to be more encouraged to lower performance than Russian enterprises. Since the Gosbank was cashier for the government, this increasingly independent behaviour of cebareps is also illustrated by the fiscal war between union and republics (see section 2.1.). Republics could only withhold revenues if they had the support of the local branch of NGB. So the NGB seemed to be infected by the disease of decentralisation in the SU.

2.2.3. The specialised banks (SB)

The law on the establishment of the SB was voted, after long and difficult discussions, on July 17, 1987. Implementation of the law and actual foundation of the SB was planned for January 1, 1988. The system of independent state-owned specialised banks never really functioned as it was meant to, because the system was adapted already in March 1989 and abolished by end 1990. However a short overview of the system is useful to get a better understanding of its legacy to the actual banking system. Note also that the reforms considered here are similar to those in many other CMEA[4] countries. Indeed in most CMEA countries specialised banks were split off from the monobank along territorial or regional lines. Schoors (1995) gives an overview.

2.2.3.1. Vneshekonombank

Vneshekonombank was the successor of Vneshtorgbank. It organised and managed all valuta accounts related to export-import operations and controlled the fulfilment of the global valuta plan. It was allowed to perform currency and gold transactions and all international payments. As a consequence the bank is allowed to operate on international financial markets. Specialised banks also could perform currency transactions if they were authorised by Vneshekonombank. The bank supported the foundation of several joint ventures and international organisations.

Vneshekonombank was the majority shareholder of most USSR-banks abroad (Moscow Narodny bank in London (MNB); Agency of the MNB in Singapore; Eurobank in Paris; Ost-West Handelsbank in Frankfurt am/Main, Donau Bank in Vienna; East-West United Bank in Luxemburg,...) (Massioukova, 1992). Vneshekonombank is the abbreviation for «Банк Внешнеэкономической Деятельности СССР», which means 'Bank for Foreign Economic Activity'.

2.2.3.2. Promstroibank

Promstroibank was the successor of Stroibank (Salonen, 1991). It mainly supplied credits to and financed investments in heavy industry, construction, transport and communications, and the Gosnab-system[5]. Compared with Stroibank, Promstroibank has more autonomy and market functions. Promstroibank is the abbreviation for «Промышленно-Строительный Банк,

which means 'Industry-Construction Bank'.

2.2.3.3. Agroprombank

This bank was established to supply financial services to the agro-industrial sector and consumer cooperatives. This sector used to be financed by Stroibank and GB directly. The well-functioning of this bank was rather important. At the time of its foundation 50% of all short term credits, 70% of all long term credits and almost 25% of all capital investments in the Soviet economy were situated in its predestinated sectors (Garetovsky, 1988, p.6.). So this new bank was important if not only by its scale. Agroprombank is an abbreviation for «Агро-Промышленный Банк», which means 'Agro-Industrial Bank'.

2.2.3.4. Zhilsotsbank

This bank supplies financial services to the social-cultural and non-production sector, light industry, state trade and distribution, municipal housing and municipal economy and common services[6] (Garetovsky, 1988, p. 7). The bank is also intended to support the development of a network of cooperatives and of individual labour[7]. Off course the supply of financial services to the emerging cooperative sector will be taken over by the emerging newly founded commercial banks.

Zhilsotsbank is an abbreviation for «Банк Жилищно-коммунального Хозяйства и Социального Развития СССР», which means bank for housing-municipal economy and social development of the SU.

2.2.3.5. Sberbank

Sberbank reemerged as the state savings-bank. The network of saving banks, that was incorporated in GB on 1 January 1963, is now reestablished as an independent savings bank. The NGB stays however a major partner in Sberbank and clearly wishes to hold influence. This is proved by the fact that since November 1993 the CBR, which is the Russian successor of NGB, became majority shareholder in the Sberbank.

Sberbank supplies financial services to the population, such as management of deposit accounts, supply of consumer credit, cash withdrawals by the population and distribution and repayment of state obligations.

Sberbank is an abbreviation for «Банк Трудовых Сбережений и Кредитования Населения CCCR» or shorter «Сберегательный Банк», which means correspondingly 'Bank for Savings of the Workers and Crediting of the Population of the SU' or in the shorter version 'savings bank (interview with Lyalkov, 1995).

2.3. The commercial banking sector

The law on state enterprises of June 1987 urged the state enterprises to found corporate banks. Article 23 of the Law on cooperatives of August 1988 allowed the creation of private banks outside the framework of the state-owned specialised bank system. This only legalised an

evolution that already was taking place informally from end 1987. The function of these banks was merely to function as an internal bank with the founders as the main clients. They are often referred to as 'pocket banks'. The Russian literature distinguishes between cooperative banks and commercial banks. This distinction is unclear because both types are off course commercial banks. Commercial banks can then be both cooperative banks or pocket banks.

The SU first cooperative bank was formed in Chimkent, Kazakhstan on August 24, 1988. It was named «Союз», which means union, had a start-up capital of one-million rubles and was authorised to collect up to 20 million rubles deposits from individuals and enterprises. On 26th August 1988 «Патент» was founded in Leningrad and on 29th August «Москоопбанк» was established. (Fuchita, Osaki and Miwa, 1993). These cooperative banks were set up to supply financial services to the emerging cooperative sector, that encountered huge financial constraints, because state banks were very reluctant to provide funds for not planned production. The funds for these cooperative banks were collected in the private sector. They are real banks that, from the beginning on, are fully independent and responsible for their portfolio management.

The first corporate bank was set up in Tartu, Estonia on September 26, 1988. It was named «Тартуский коммерческий банк», which means 'commercial bank of Tartu'. (Fuchita, Osaki, Miwa, 1993). Corporate banks are commonly erected by big state enterprises, state holdings or other state bodies, that are also meant to be the main clients. Most of the corporate banks were former treasury divisions of state bodies that are given independence or joint-stock companies funded by state bodies. Those banks are partially more financial coordination centra of the corresponding concerns than banks. But they anyhow create money and can possibly develop into a more independent institution.

Massioukova (1992) distinguishes between five types of banks : cooperative, innovation, business, industrial and regional banks. It is however very unclear what these categories exactly mean.

Official registration data of the CBR show that by end 1988, 41 commercial banks were founded among which 17 corporate banks and 24 cooperative banks. By end 1989 already 225 commercial banks were licensed. These new banks were badly supervised because of the lack of relevant legislation and the lack of experience on the side of NGB. The sector had often close links to state enterprises or criminal organisations and in general faced a lot of problems such as the lack of any regulation and the sectoral monopolies of the specialised banks. Only in December 1990 commercial banking activities will be regulated. We must conclude that from 1988 on there originates a fast growing, unregulated, and de facto badly supervised commercial banking sector, within an environment that is legally and mentally unfitted for market operations or market discipline.

2.4. Important characteristics of the system

The monobank system was split into parts. Five SB were founded (Vneshekonombank, Promstroibank, Agroprombank, Zhilsotsbank and Sberbank) that were theoretically independent from NGB. These banks however still were sectoral monopolies. Moreover we will show that the influence of the old system strongly persisted in the new system.

All five SB were organised according to the following principles : They had branches in every republic and department. In cities and quarters however the SB continued to work within the old GB-branches, that receive now instructions and indications from a number of SB. Many of the old GB structures were simply renamed and continued to exist. Staff in the central head-quarters of the new SB increased, while staff in the operational branches was reduced. In other words this means that the monobank was only split up at the upper level, but that the opera-tional structure didn't change much in the short run. This led to a very unclear management control structure. Personnel at the operational level received orders from different bosses. Often orders were divergent or even contradictory. Moreover all personnel continued to be paid directly by the state and the hierarchy of the SB was filled with people from the old system, that reacted in the old way. Also the SB were specialised so that competition would not occur.

The most important innovation caused by the installation of the SB, was the change in credit planning. Before the SB, GB awarded credits to ministries that were responsible for the further distribution among their enterprises. According to the reform, the SB became holders of the credit funds and they distributed them over their sector. The SB made credit agreements with enterprises and had the right to declare an enterprise insolvent. So the central bank lost its absolute control over the creation of non-cash money. Also, the NGB lost its instrument to control plan fulfilment by the enterprises. As mentioned in section 2.1., weaker central planning in combination with the unchanged implicit fiscal system, leads to perverse incentives for enterprises to lower performance.

The NGB was still the most important but not the only cash centre in the country. First, the NGB had the monopoly on cash emission in the USSR and cebareps received cash for republi-can circulation directly from NGB. Second, all enterprises and organisations drew their cash from NGB and were obliged to return all their cash surpluses to the NGB. However also the other SB and the emerging commercial banks dealt with cash and accepted deposits of cash.
The strict separation of cash and non-cash remained. Interenterprise credit was equally not admitted and credit allowed by the state financial system stayed quasi-costless, which caused major inefficiencies in the allocation of capital.

The NGB still functioned far from as a Western central bank. The NGB was totally dependent on the government and the Ministry of Finance and it seems to have kept some of its mono-bank characteristics. Unlimited monetary financing of budget deficits was allowed, which crea-ted a huge potential for inflationary pressures. Gradually awareness grew that Russia needed a more independent central bank, which led to the laws on the central bank in December 1990 and the new statutes of the Central Bank of Russia in June 91. The implementation of these laws would take even more time.

The most important innovation was the genesis of the commercial banking system via corporate and cooperative banks. During 1988-1990 a commercial banking system emerged without any suitable or consistent legal framework. This led finally to the new law on banking in December 1990. We should also note the increasingly independent behaviour of the ceba-reps. This behaviour was clearly motivated by self-interest (as shown in section 2.1.) And constituted the prelude for the bank war between centre and republics in the early nineties and

ultimately the process of disintegration of the ruble zone, that was completed in late 1993.

2.5. The payment system

The development of the payment system is analysed in detail in chapter IV

3. Rapid of events between 1990 and 1992

3.1. General framework

In this period a plethora of new laws and regulations were put in place. The consequences for the developing banking system were huge.

- Law in March 1989, that reconstitutes the SB. The SB become financially independent and have to operate under the principle of khosrashot (independent profit system). Customers were given the opportunity to use the bank of their choice and obliged sectoral specialisation was abolished (Kivilahti, Kero, Tekoniemi, 1993)
- Decrees of the Supreme Soviet of Russia on 13 July 1990 and 6 August 1990 on the transformation of the specialised state banks into business banks on the territory of the Russian Federation.
- August, 1990 : The republican branches of the NGB, become republican central banks
- Law of the Russian Federation on 2 December 1990 on activities of the central bank and banking activities.
- Law of the USSR of December 1990 on activities of the central bank and banking activities.
- New statutes of the central bank of Russia in 24 June 1991.
- Introduction of a centralised clearing system by the new central bank in October 1991 (for a detailed analysis of this new RKT-system see chapter IV).
- Resolution by the Supreme Soviet of Russia on 22 November 1991, that claims the unilateral takeover of NGB by the Central Bank of Russia, including the single emission right of cash rubles.
- Law of 25 December 1991 that liquidates the NGB. Gerashenko, the chairman of the NGB resigns, together with Gorbachev, the President of the former Soviet Union. They were the last symbols of unity in the disintegrated union.
- Dissolution of the SU , 26 December 1991.

These events reveal two extremely important tendencies in the developing financial system, namely the centrifugal bank war between centre and republics and the evolution towards a two-tier banking system with a central bank and a commercial banking sector.

First, events in the early nineties reveal how the power struggle between Gorbachev and Yeltsin (elected president of the Russian Republic in June 1990), or in other words between the SU centre and its republics, is reflected in the structure of the financial system. This is referred to as the "bank war" (Kivilahti, Kero, Tekoniemi, 1993). A first indication of this war showed already in mid-1990 when the central bank of Russia unilaterally required all banks on Russian territory to restructure as commercial banks before end-1990 according to the decrees of 13 July and 16 August 1990 (IMF, 1992b). This caused the reorganisation of the SB in 1991 and their splitting up along territorial lines, mostly in regional banks.

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The bank war culminated in December 1990, when the Yeltsin Government voted a law on banking in Russian parliament just some days before a comparable but slightly different law was voted in the Union parliament. The Russian law explicitly transforms the Russian branch of the NGB into the Central Bank of Russia (CBR), which de facto means that the republican branches of the former NGB become republican central banks. Officially the CBR was still subordinate to the NGB, but in practice the CBR turned out to behave very independently from NGB as a real central bank. Finally the CBR even unilaterally assumed NGB remaining centralised powers on November 22, 1991, including the ruble printing press. Moreover the NGB that officially existed till end 1991 did not prepare a credit plan for the republican central banks in 1991 (IMF, 1992c). This environment of growing centrifugal powers in a dying union induced uncoordinated behaviour between central banks of different republics, not credible and inflationary monetary policy and finally appeared to be the prelude of the disintegration of the ruble zone (see chapter IV). This evolution to an independent CBR found its legal materialisation in the statutes of the CBR in June 1991 and the liquidation of NGB on December 25, 1991. While the official end of the USSR occurred only end 1991, we may consider December 1990 as the actual date when the financial system fell apart. After December 1990 the financial power struggle was fought openly and with full strength.

Against these centrifugal powers in the financial system, there were some attempts to construct a unified financial system of a new type. The new Union Treaty of Gorbachev was the first attempt in the row, but the Treaty was never signed because its conservative opponents considered it too decentralised. They tried with little conviction to reverse the course of history by means of a Coup in August 1991. As everybody knows, this coup had the opposite effect. Yeltsin and thus centrifugal powers arose out of the conflict as the clear victors of the power struggle. Another attempt was the proposed treaty on an Economic Union in October 1991. In this treaty was stipulated that the members intended to keep the ruble as common currency. The creation of a bank union was also provided in the treaty. Nevertheless republics could leave the ruble union on certain conditions. In general the Economic Union gave far more power to the republics than the denounced Union Treaty. Gorbachev tried to save some form of political union and proposed in November 1991 a new version of the denounced Union Treaty of August 1991. In this new proposal he tried to reestablish the union as a confederation of independent States. However Gorbachev's brave attempts couldn't prevent the establishment of the CIS by Russia, Ukraine and Belarus and the ultimate falling apart of his Soviet Union. The CIS was never a big success as an organisation. One could get the impression that the main rationale for the formation of the CIS, was the definitive political destruction of the union. When we look at the events in 1991 with hindsight, it is clear that Russia unilaterally reformed its financial system, forcing the other republics to follow and pushing aside Gorbachev and his Union government.

The second important trend is the evolution towards a two-tier banking system with a central bank and a commercial banking sector. First, the specialised banks were again reformed and started to operate according to commercial lines (March 1989). Later, the specialised banks were split mostly along territorial lines in regional, commercial banks, sometimes with special status (decisions in July and August 1990 that had to be implemented before 1 January, 1991). Second, the new commercial banking sector grew fast and could not be neglected any more. We note here that, with regard to the origin of the bank, one can distinguish three types of

banks : banks founded by large state organisations, enterprises or groups of enterprises (pocket banks), de novo private banks established with private capital, and the successors of the SB which we call former state banks or in short state banks. Indeed the five SB were split up in several hundreds of banks. This process in reality already started in 1988 and continued during the nineties. Also the process was not coordinated or even managed, but rather a spontaneous process with regional managers taking opportunity and founding their own banks from the ashes of regional branches. We describe this process of spontaneous privatisation more in detail in section 3.4. The structure and the legal framework of the two-tier banking system were finally established in December 1990. From then on the evolution towards a commercial banking system could not be stopped any more.

The USSR-banking law of December 1990 was not globally adopted by each republic. The republics rather passed amended republican versions of the law (IMF, 1992b). Nevertheless the basic principles of the USSR law on banking from December 1990 formed in most republics the legal basis of the financial system. Therefore the law is of major importance to understand the working of the financial system in former republics.

3.2. The banking laws of December 1990

The competing laws on activities of the central bank and banking activities of December 1990 were very important for different reasons.

First, the monobank-system is officially abolished and reformed into a market oriented financial system. These are the first legal acts that clearly and indisputable stipulate the erection of a two-tier banking system with a central bank and a commercial banking sector. On most of these issues the two laws seem to be copies of each other. The properties of the new, mostly common, system are compared below in table II.4.

Second, the laws mainly differ on the issue of the power of the centre versus the power of the republics. The USSR-law transforms NGB and the cebareps in a federal reserve type system of central banks. The Union persisted also in its common currency and a common financial system. The RSFSR-law implicitly declares the independence of its financial system from the Union-system. Therefore we can say that these laws clearly show a climax in the bank war and that from the point of view of the financial system, the USSR was de jure dissolved as early as December 1990.

In table II.4., we observe that the USSR-law is better elaborated than the RSFSR-law. More-over, the two laws are equivalent on matters that concern the functioning of the banking system. Actually, the only important difference is the issue of power distribution between centre and republics. One cannot reject the impression that the RSFSR-law is a rush job, in order to be voted nine days before the USSR-law, mainly motivated by the will to express the independence of the RSFSR from the USSR.

Table II.4. Comparison between the law on the central bank of the RSFSR (2 December 1990, Supreme Soviet of the RSFSR) and the law on the state bank of the USSR (11 December 1990, Supreme Soviet of the USSR)

Law on the State Bank (Gosbank) of the USSR	Law on the Central Bank of the RSFSR (CBR)
General Issues	
-Gosbank becomes the Central Bank of the USSR (art. 1).	-The CBR is created (article 1).
-Gosbank and the cebareps together form a central bank system, based on a common currency, and function as a reserve system (art. 2.1.)	-The CBR can join with other cebareps in a banking union, within the limitations set by the Supreme Soviet (SS) of the RSFSR (article 7). Gosbank nor reserve system are mentioned
-All activities of the reserve system are regulated by this law. Only activities of the cebareps that are not related to the reserve system may be regulated by republican laws (art. 2.3.). Acts of cebareps related with their function of reserve system that are in contradiction with acts of the central board of Gosbank can be deleted by the chairman of Gosbank (art. 47.1.d.)	-The activities of the CBR are regulated by this law, other laws of the RSFSR and its statutes (art. 4). Subordination of any kind to Gosbank is not mentioned.
-Gosbank answers to the SS of the USSR and is independent from other state organs (art. 6.1)	-CBR answers to the SS of the RSFSR and is independent from other state organs (art. 1).
-The USSR is not responsible for obligations of the Gosbank and vice versa (art. 3.2)	-The RSFSR is not responsible for obligations of the CBR and vice versa (art. 2)
Legal tasks of Gosbank-CBR	
-Stability of common currency (art. 4.1)	-Stability of the ruble (art. 5)
-Common financial policy within the reserve system (art. 4.2)	-Single money and credit policy in the RSFSR (art 5)

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-Regulation of banking activity and control on banking activity
(art. 4.3, 5.1.g, 27 - 41)
-Reserve system of the USSR (art 5.2)
-Emission of cash money (art 5.1.a)
-Organisation of money circulation (art. 5.1.a).
-Lender of last resort (5.1.b)
-Serve state debt of union and republics (art. 5.1.d, 22)
-Fiscal agent and cashier of the government (art. 23)

-Regulation of banking activity and control over banking activity
(art. 5, 22 - 34)
-Not mentioned
-Emission of cash money (art. 11)
-Regulation of money circulation (art. 5)
-Lender of last resort (art. 14)
-Serve state debt of RSFSR (art. 17)
-Fiscal agent and cashier of the government (art. 17)

Instruments of monetary policy

-Credits to commercial banks (art. 14.2.a)
-Interest rates on these credits (art. 14.2.d)
-Open market transactions (art. 14.2.b)
-Required reserves (art 14.2.c)
-In case of major inflation problems, there can be direct limitations of commercial interest rates and commissions of commercial banks
(art. 17.1)

-Credits to commercial banks (art. 14, 15)
-Interest rates on these credits (art. 14, 13)
-Open market transactions (art. 13)
-Required reserves (art 13)
-Not mentioned

Budget deficits

-The Gosbank and cebareps supply credit to the Ministry of Finance in order to cover budget deficits by means of the purchase of government paper. The credit limit is determined by the SS of the USSR. In special cases this limit can be overruled for a short period. (art. 21)

-The CBR supplies short term credit (maximum of six months) to the Ministry of Finance in order to cover temporary budget deficits by means of the purchase of short term government paper. The credit limit is determined by the SS of the RSFSR. (art. 17)

Regulation of commercial banking activity

-Licensing and registration of commercial banks (art. 28, 29)
-Minimal capital (art. 31.a)

-Licensing and registration of commercial banks (art. 23)
-Minimal capital (art. 24)

-Capital-asset ratio (art. 25)
-Liquidity ratios (art. 26)
-Required reserves (art. 27)
-Maximal risk on one creditor (art. 28)
-Maximal levels for interest rate risk and exchange rate risk (art. 24)
-Limitation to the purchase of shares with money of depositors. (art. 24)

Board of directors

-Not mentioned
-The chairman is appointed for a term of five years by the SS of the RSFSR.
-The chairman proposes the other members of the board of directors. Their appointment must be ratified by the presidium of the SS.

-Capital-asset ratio (art. 32)
-Liquidity ratios (art. 33)
-Required reserves (art. 34)
-Maximal risk on one creditor (art. 35)
-Maximal levels for interest rate risk and exchange rate risk (art. 36)
-Not mentioned

-The board consists of 12 members
-The chairman and his first deputy are appointed for a term of six years by the SS of the USSR on proposition of the President.
-10 other members, chairmen of cebareps or other representatives of the republics, are appointed for four years.

Source : own translation of both laws.

3.3. Banking institutions in the early nineties before 1992

3.3.1. The Central Bank of Russia succeeds the Gosbank

The remainder of Gosbank (NGB) got new statutes with new functions (July 1991), that were closer to the functions of a genuine central bank. Later on the Russian branch of NGB was reformed and renamed in 'Central Bank of Russia' (CBR). Some months later (November 1991) the CBR assumed the NGB's remaining functions and the NGB was finally abolished (December 1991). However the CBR - new style kept major interests in the commercial banking sector. This is proved by the acquisition in November 1993 by CBR of an additional share in the capital of Sberbank, the largest of all commercial banks and former part of the monobank (Finansovye Izvestiya, 5 December 1993). As a consequence the CBR became the majority shareholder in Russia's largest commercial bank, which is an extremely weird position for a central bank. In chapter III, we will document the dominant position of Sberbank in Russia's financial markets.

3.3.2. The central banks of the republics

By end 1990, the republican branches of the NGB had become de facto independent. In 1991 the cebareps were free to determine their own monetary policy. This situation was affirmed by the dissolution of NGB in December 1991. From then on, the republican branches of NGB became de jure the central or national banks of the various republics. We will show that this created a huge free-rider-dilemma and therefore is sometimes referred to as the worst monetary constitution one can imagine (see chapter IV).

3.3.3. The fate of the specialised banks

As already mentioned in section 3.1., the SB first were forced to work according to commercial lines and then split up in regional independent commercial banks. The five SB were split up in several hundreds of banks. This process already started in 1988 and continued during the nineties. The process was also not coordinated or even managed, but rather a spontaneous process with regional managers taking opportunity and founding their own banks on the ashes of regional branches. An amazing large number of banks are of this type (see 3.4.). The biggest successors, described more in detail below, remained important in the new financial environment. Their Soviet history put a heavy burden on these banks and still influences their functioning in the emerging financial markets, as will be shown throughout this dissertation.

3.3.3.1. Vneshekonombank

Vneshekonombank lost a lot of its responsibilities but continued to exist as a part of the central bank-system of the union, later of the CIS. According to the debt-agreement among eight former republics and the G-7 in November 1991, the Vneshekonombank became the debt-manager for all foreign debts of the (former) Union (IMF, 1992a). Moreover the institution will manage all new Russian government debt and procure state guarantees for state projects. On 13 January 1992 the President of the Russian parliament signed a decree, stating that Vneshekonombank had to respond to the CBR. This confirms that Vneshekonombank became part of the central bank-system. It lost all its functions as bank for foreign economic activities.

3.3.3.2. Rosvneshtorgbank

Vneshtorg, at first founded in 1922 and liquidated end 1987 (see higher), is recreated on January 2, 1991 under the name Rosvneshtorgbank. This means "Russian Bank for Foreign Trade". Rosvneshtorgbank takes over all responsibilities that Vneshekonombank had in its function as bank for foreign economic transactions. The bank manages Russia's foreign exchange reserves. Rosvneshtorg was established as a joint venture with majority shareholder CBR (Kivilahti, Kero, Tekoniemi, 1993).

3.3.3.3. Sberbank

Sberbank is reformed into the Independent Savings Bank of Russia only in 1991 (registration as joint stock company). It is however still commonly called Sberbank. At present Sberbank is regarded as a commercial bank which operates under very special arrangements. It is exempt from the obligations to which other commercial banks are subject, for example reserve requirements. The majority shareholder is the CBR, but in addition there are more than 1,700 juridical and over 50,000 physical shareholders. Sberbank itself is shareholder in hundreds of commercial banks. Deposits are protected by a government guarantee on customer deposits, which is compensated by the low rate of interest on deposits. Sberbank continues to finance the government budget deficit, but it also began to finance commercial banks, cooperatives, agricultural units and small enterprises. (Kivilahti, Kero, Tekoniemi, 1993; interview with Lyalkov, 1995).

3.3.3.4. Agroprombank and its successors

Agroprombank was officially dissolved on 1 January 1992. The main successor of Agroprombank became Rosselkhozbank, which took over the Russian branch network of Agroprombank and became at that moment the biggest bank in Russia. Rosselkhozbank is the abbreviation for « Российский Селькохозяйственный Банк», which means "Russian Agricultural Bank". The bank however stays a representative of the Russian government. It supplies agricultural enterprises with preferential loans and receives funds for this purpose from the budget. In addition, the bank provides normal cash and payments services. (Kivilahti, Kero, Tekoniemi, 1993). Agroprombank was not only succeeded by Rosselkhozbank, but also by a network of smaller regional agricultural banks, that finance agricultural and agro-industrial enterprises (Massioukova, 1992). This was also confirmed by our own field-research.

3.3.3.5. Promstroibank and its successors

The main successor of Promstroibank was Promstroibank. Indeed the old Promstroibank was reorganised as a joint-stock company and registered as commercial bank in November 1991 (Annual Report of Promstroibank, 1992). The bank continued its predecessor's activities. In April 1992 the bank was granted a special status by the government : Promstroibank became a representative of the government and provided financing for programmes that are given priority by the government. The preferred sectors include agriculture, energy, transport, telecommunications and the armament of industry. (Kivilahti, Kero, Tekoniemi, 1993). However some regional branches of the old Promstroibank became independent. Ouralpromstroibank and Kouzbassprombank are examples of such new banks. (Massioukova, 1992). The process of spontaneous privatisation of Promstroibank is described in detail in section 3.4.

3.3.3.6. Zhilsotsbank and its successors

The main successor of the Soviet Bank for Housing, Local Government and Social Sectors is Mosbusinessbank, that was set up on the foundations of the old head office (Salonen, 1991). Zhilsotsbank was reorganised as a joint stock company in 1990, when the Ministry of Finance was the bank's major shareholder. Later on, subsequent new regulations governing banks' shareholdership obliged the ministry to dispose of its holding. The old head office became independent and was named Mosbusinessbank. Mosbusinessbank is an abbreviation for «Московский Бизнес Банк», which means "Moscow Business Bank". The major shareholders include the Executive Committee of the City of Moscow, a children's fund and a number of state enterprises and organisations (Kivilahti, Kero, Tekoniemi, 1993). Besides Mosbusinessbank there have been established about a hundred different banks on the ruins of Zhilsotsbank (Salonen, 1991).

3.3.3.7. Importance of these (former) specialised banks

The successors of these specialised banks are of major importance in the emerging system. When we analyse the list of the biggest banks in the CIS in 1991 (Известия, 13 February, 1992) we see that the ten biggest banks in Russia, classified according to the scale of the charter capital, contain four successors of specialised banks. When we classify the banks according to the scale of their assets, we even observe that the four biggest banks are successors of specialised banks, namely Sberbank, Promstroibank, Rosselkhozbank and Mosbusinessbank. We will see throughout this dissertation that the big state banks continue to dominate the Russian financial markets, with Sberbank playing a particular role.

3.4. The strong growth of the number of private banks

The number of commercial banks grew strongly between 1990 and 1992. By end 1991, 1360 commercial banks had registered with the CBR. A lot of completely new banks were founded by state enterprises, cooperatives and wealthy individuals. However the role of these banks was still quite limited. One of the main sources of bank creation between 1990 and 1992 was the process of splitting, corporatisation and spontaneous privatisation of former state banks. For convenience we will in this work refer to banks that were founded on the basis of a former state bank (a SB) as 'state banks' or 'former state banks'. In reality these banks are not state-owned, but still we use the name 'state bank' or 'former state bank' to distinguish them from other banks that were not established on the remainders of one of the SB. All state banks were deliberately reformed to common stock commercial banks, with widespread shareholdership. However, next to this the state banks concerned, also experienced a process of spontaneous privatisation. Individual branches, local departments or regional departments of former state banks declared themselves independent and registered as independent banks. Shareholders were typically the largest clients of the branches of departments concerned. Only two large SB were able to avoid this process of spontaneous privatisation, namely Sberbank and Vneshtorgbank. The CBR is their majority stockholder and thus continues to play indirectly an important role in commercial banking.

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This process of spontaneous privatisation lies at the origin of several hundreds of banks and is therefore an important process. We do not intend to run the list of all the banks created in this way. As an example we will explain the process of spontaneous privatisation of Promstroibank.

As described at large above Promstroibank was one of the large state banks in the Soviet system. Together with Sberbank and Agroprombank, Promstroibank was one of the oldest banking structures in Russia. In November 1991 the bank was reestablished as a limited liability company and registered as a commercial bank at the CBR. During 1990-1992, Promstroibank had no control over events. First of all, a large number of sectoral, regional and local branches were spontaneously and without previous consent being privatised by their managers. In practice the new shareholders were the main clients of the branches concerned or other important local enterprises. Promstroibank managed to become the main shareholder (but not always the majority shareholder) in 12 of these banks. Together with the mother, these twelve daughters formed the so-called "Promstroibank Holding Group" in 1992. However the majority of branches became totally independent of Promstroibank. Most of them entered to the bank association of former members of Promstroibank, named 'Russia'. Among these completely independent banks are some important players on the Russian banking market that do not hide their origin, but also a number of small banks that are very well disguised with new fashionable names (Annual Report of Promstroibank, 1992; interview with Kondatriuk in 1994; data from own field research).

The number of successors of the specialised banks should not be underestimated. The CBR (1994) notes that in begin 1994, 609 of the 2041 registered banks are actually successors of the former SB, which amounts to 29.8%. Of these 609 banks, 42.7% were successors of Agroprombank, 28.2% were successors of Promstroibank and 20.2% were successors of Zhilsotsbank[8]. The dominance of the banking system even becomes larger if we consider scale variables. The deposit market was badly dominated by Sberbank (see chapter III). In 1994 there were still five state banks (Sberbank, Vneshtorgbank, Promstroibank, Mosbusinessbank and Agroprombank) among the ten biggest Russian banks. The assets of Sberbank were larger than the accumulated assets of the nine other top ten banks (RET, various issues).

We want to show with data that in 1990-1992 there was a large scale process of spontaneous privatisation of state banks, while in 1992-1994 newly founded banks were mostly genuinely private. In order to demonstrate the scale of the spontaneous privatisation we screened sample B as shown in Table II.5.

Table II.5. illustrates that most former state banks were founded before 1992, in the process of what we have called spontaneous privatisation. Indeed of the 63 former state banks in 1994, 58 were founded before 1992. After December 1991 on the contrary, most new banks were not founded on the basis of former state banks. This suggests that there is likely to be a positive correlation between the age of a bank and its type. It also shows that the Russian SB were already privatised (though to a large extent spontaneously) before the demise of the Soviet Union. Many western observers seem not to be aware of this. One of the remaining stumble blocks to transition and financial burdens to the budget in some of the most advanced transition countries (such as Hungary, Poland or the Czech Republic), is precisely the presence of large and unprofitable state-owned banks. Their restructuring and privatisation is troublesome, but much needed and long overdue. Russia will not have this problem because it has proceeded

silently but very swiftly with this reform issue. Actually the Russian SB were privatised before the enterprises were privatised and even before the price reform of January 1992. Russia is one of the few transition countries that has done so. The timing of Russian reforms differs significantly from the timing in other transition countries in this respect.

Table II.5. Spontaneous privatisation illustrated

Date of the account	92	93	94
Sample B, all banks			
total of banks	50	76	230
of which state banks	31	36	63
state banks as % of total	62.0%	47.4%	27.4%
Sample B, banks founded before 01/01/92			
total of banks	45	54	142
of which state banks	30	33	58
state banks as % of total	66.6%	61.1%	40.8%
Sample B, banks founded since 01/01/92			
total of banks	5	22	88
of which state banks	1	3	5
state banks as % of total	20.0%	13.6%	5.7%
Source : own analysis of sample B			

4. Evolution of the banking system since 1992

This is the subject of the rest of this dissertation. Therefore we will limit ourselves here to the presentation in table II.6. of some basic statistics that give a fine introduction of what will come in the following chapters.

Table II.6. Evolution of the banking system in 1992-1996

	1992	1993	1994	1995	1996
Number of banks in operation	1713	2019	2517	2295	2030
Licences withdrawn (cumulated)		13	78	303	592
Minimal capital requirements					
for new banks (mln dollars)	214.4	70.6	1244.7	1291.5	3648.9
		in % of GNP			
Centralised credit resources (CCR)[9]	15	5.1	2.4	1.1	0.6
Bank credit to the economy	33.6	20.4	19.6	12	10
Interbank credits received		3.2	4.9	3.9	3.1
Gross assets of the bank sector	88	54	56	36	36
Household deposits	1.9	2.4	4.2	4.3	5.3
Of which outside Sberbank	0.3	0.9	1.7	1.5	1.4
Source : OCDE, 1997, p. 87					

The most important observation from table II.6. is that our period of study is well chosen. For most indicators of the bank sector there seems to be a break after 1994. The number of banks starts to decrease, while the number of withdrawals increases strongly. Bank credits to the economy fall strongly, which is firmly related to the decrease of CCR to normal market values. More importantly household deposits grew in 1995 and 1996, while deposits with commercial banks (outside Sberbank this is) decreased. Apparently the commercial banks are not able to attract the growing deposits of the Russian households.

After 1994, budget constraints for banks became harder, prudential control of the CBR was strengthened and CBR-credits to commercial banks decreased. As a consequence we observe a process of desintermediation with decreasing deposits and decreasing credits of commercial banks. Credits to the economy decrease from 33.6% of GNP in 1992 to 10% GNP in 1996. These numbers may however overstate desintermediation. Of the 33.6% in 1992, 15% was based on the intermediation between CCR and credits to the economy, with a very passive role for banks (see chapter III and V). In 1996 the 10% of credits allocated was almost fully based on genuine bank intermediation. In addition to this 10% of credits to the economy, banks invested a large share of their resources in government debt. Still we observe that also gross bank assets decrease strongly from 88% of GNP in 1992 to 36% of GNP in 1993. However, the numbers in table II.6. may also understate the desintermediation, since GNP is likely to be underestimated and the underestimation is likely to be stronger in 1996 than in 1992.

Anyhow, it seems that the bank sector developed strongly between 1992-1994 and was struggling with some serious problems in 1995-1996, causing a process of desintermediation. In this work we will analyse deeply the apparent strong development in 1992-1994 and try to find out whether the problems of 1995-1996 were to be expected.

Notes of chapter II

1. Khozraschot is a Russian abbreviation that stands for 'economic accounting'. In practice it means that an economic entity that operates on khozraschot has an independent profit-and-loss account. The entity must cover operating expenses with income from sales to other enterprises or consumers. However the system does not allow deviations from the state plan. It is a device to urge economic agents to maximise profits or minimise losses, within the framework laid down in the central plan (Nove, 1986).

2. Finansy, 1987, No. 5.

3. By "profit distribution" is meant the distribution of profit between the enterprise and the central budget.

4. Council for Mutual Economic assistance, also more commonly referred to as the COME-CON. CMEA is the international economic cooperation framework of the former communist bloc. It collapsed together with the collapse of the communist bloc.

5. The Gosnab-system is an abbreviation for «Государственное снабжение» (gosudarstven-noe snabjenie), which means "state supply". Gosnab was the state institution that was responsible for the supply and distribution of raw materials and intermediate goods to enterprises.

6. 'Common services' is used as translation for the concept «бытовое обслуживание» (byto-voe obslujivanie), which according to Ojegov means "institutions supplying services to people in the sector of their daily needs".

7. The law of November 1986 on individual labour allowed Soviet citizens to perform economic activities such as handicraft, common services, medical services and social-cultural activities.

8. Tekushie Tendentsii V Denezhno Kreditnoi Sfere, 1994, No. 4, p. 17.

9. See chapter III, section 5 for a detailed explanation of the exact meaning of the concept centralised credit resources.

Chapter III. Bank liabilities

0. Overview

In this chapter we address several key issues that concern bank liabilities. In the first section we consider bank regulation and prudential control as far as it is related to bank liabilities. This is logical since guaranteeing safety of small depositors and hence systemic stability constitutes the main motivation for prudential control of banking. Then we analyse the capitalisation of Russian banking. The third section concentrates on bank deposits. The fourth section analyses the role of the CBR in bank funding. While profit is indeed an important source of funds, the analysis of profitability is postponed until chapter VI because we first need to assess payments (chapter IV) and bank assets (chapter V). Last, we test some hypotheses on the sources of profit. As a result of the analysis in this chapter several points will be put forward :

- Prudential control was in practice very weak, no matter what the official requirements were.
- Average bank scale is very small, but there does not seem to be a general problem of under-capitalisation at first sight.
- On average, payout ratios are very high, which is in sharp contradiction with western experience and with what one would expect in a fast growing banking market.
- As a consequence there seems to be a process of substitution of deposits for capital. This substitution depends on the relative costs of capital and deposits.
- From this substitution process follows another inference: There may loom an important problem of undercapitalisation, since precisely the largest and most active banks with the highest deposit base, seem to have the lowest capitalisation.
- This also shows that depositors do so far not consider a high capitalisation to be an important indicator of stability of the bank. Otherwise banks with high capitalisation would be able to attract more deposits than banks with lower capitalisation, other things being equal.
- Sberbank dominates the market of household deposits. The downward trend of the market share of Sberbank in 1992-1993 was stopped and reversed in mid-1994. This leaves the deposit market with one major player, controlled by the CBR.
- The dollarisation of the economy has reached an amazing scale and will not easily be reversed.
- The dollarisation is driven by exchange rate fluctuations, inflation and overshooting behaviour.
- Deposit rates function as a signalling device for bank reputation.
- The deposit market is characterised by deposit rationing.
- The practice of directed credits (DC) has prolonged the soft budget constraint and hindered bank restructuring.

1. Prudential regulation and control of banks

1.1. General

There is no consensus in the literature on why and how to perform prudential regulation and control of banks. A complete overview of the literature is given by Dewatripont and Tirole (1994). We follow them in their analysis that the basic motivation for banking regulation is the need to protect small depositors. These depositors have no incentive, nor the capacity to monitor the bank at which they hold debt. This creates the need for representatives that perform this monitoring for them, be it private or public representatives. The authors refer to this as the 'representation hypothesis' of banking regulation. All other motivations for regulation found in the literature are subordinate to this representation hypothesis. This approach also explains why we tackle prudential regulation and control in the chapter on bank liabilities and not in for example the chapter on assets or on the payment system.

Though there exists no common theory on how banks should be regulated, one nevertheless observes that regulation regimes are converging across the world. The growth of world capital markets has certainly stimulated this development. Also the recommendations of the BIS play an important coordinating role. One observes that the stress lies more and more on solvency and capital adequacy and less on liquidity. This is probably due to the emergence of explicit deposit insurance in most countries. This lowers the probability of a liquidity crisis and a bank run in the sense of Diamond and Dybvig (1983). It is precisely this prospect of bank runs which constitutes one of the main systemic risks of commercial banking. This risk may largely be contained by deposit insurance in Western markets, but this is not the case in Russia. Therefore one might expect that in Russia liquidity-based regulation will also be important.

In this part we will address the issue of prudential regulation and control in Russia. Control and regulation are not the same. They are separated by the gap of implementation and enforcement of the rules set out in the regulation. This gap is particularly important in Russia.

1.2. Prudential regulation of Russian banks summarised

According to the law on the CBR of December 1990[1], the CBR is the body that exerts prudential control on banks. The main objectives are to secure the stability of the financial system and to protect the interests of depositors and creditors. The main controls exerted by the CBR are the so-called economic norms. The two first norms (N1 and N2) are **capital adequacy** norms. Next, the CBR requires compliance to 6 other norms (N3 - N8), which all refer to **liquidity**. Last there exists a N9 which determines the maximum risk exposure to one borrower. These norms stem from a 1991 instruction of the CBR[2], and are described more in detail by Androsov (1995) and Vasilishen (1995). Next to these so-called 'economic norms', the CBR requires commercial banks to deposit **obligatory reserves** on a special account at the CBR (account 15). The required reserves (RR) are a function of the deposits collected by the bank concerned. They are analysed in detail in Chapter V. There we also show that required reserves are to be understood at least partially as a form of implicit deposit insurance. Important here is to note that in 1994 the CBR started to use RR as a penalty for banks which fail to meet the norms explained above. For every norm violated the CBR could rise RR 0.5 % (CBR, 1995)[3]. It is to be seen whether this use of RR as a penalty remained theory or not. There also exist minimal

charter capital requirements, next to a series of other norms of minor importance for our purpose. We observe that both capital requirements and liquidity requirements seem to be a matter of concern in Russian banking regulation.

1.3. Prudential control

Crucial to understand the impact of these regulations on commercial banks is that they are not enforced in the period under study. The CBR reported for example that, during 1993, 58% of the commercial banks violated the norms (Vasilishen, 1995). It may well be that not every violation was quite so severe, but it is even so unlikely that none of these violations was severe enough to be sanctioned although that is what happened. We conclude that there exists a large difference between prudential regulation and prudential control. To analyse why this is the case we should investigate the **instruments** and the **capacity** the CBR has in hand to exert control on banks.

The law on the CBR and its statutes imply that the CBR has access to all the information on banks' operations. The banks are obliged to send the CBR the state of accounts every week, month and year. Also the CBR holds the register of commercial banks and is responsible for licensing commercial banks and withdrawing these licenses in case of violations. There are a number of other provisions in the law, the statutes and in a number of letters and announcements of the CBR but it is clear that the CBR's access to banks' information and its right to withdraw bank licenses are its two most powerful control instruments.

The question remains whether the CBR has the capacity needed to use these instruments efficiently. Only in early 1993 the banking supervision department of the CBR was founded. The department was made responsible for regulation, monitoring and research of the banking sector. It comprises three divisions namely : the division for bank licensing, lending institutions and bank auditing division, the banking supervision regulation division and the division for the economic analysis of banking. The department was founded with only about 70 employees (Laurila, 1996). The CBR also established an inspectorate "to control the reliability of the commercial banks' accounting and financial reporting, the legality of operations and their compliance with the licence issued by the CBR" (Laurila, 1996, p. 97). This inspectorate was initially understaffed and to inexperienced to cope with its enormous task. We conclude that the low level of control was mainly due to capacity problems, which are on their turn explained by lack of will. The CBR's control department could not keep up with the growth of the number of banks in 1992-1994 and the subsequent flow of bank sheets to be verified.

We may safely conclude that in 1992 the CBR's capacity to control commercial banks was low and that the CBR only started exerting control on banks in 1993 and gradually tightened its control during 1993 and 1994. This conclusion is supported by table III.1, which shows the acceleration of control activity of the CBR from 0 withdrawals in 1992 to 65 in 1994.

In the first half of 1995, 83 licences were withdrawn, which is about the same as in 1992-1994 together (85). Over 1995 as a whole, 225 licenses were withdrawn. Moreover the majority of withdrawals in 1994 were effected in the last two months of 1994, under the new presidency of T. Paramonova. This shows that the prudential control only got started by end 1994 and was as a consequence absent in early transition.

Table III.1. Number of banks ceasing operation January 1991-December 1994

	1991	1992	1993	1994
By decision of shareholders	19	92	117	45
Of which mergers	(17)	(90)	(115)	(40)
Violation of law or regulation	1	0	19	65
Postponement of operations[4]	0	5	6	0

Source : Newsletter of the CBR, No. 33, p. 2

1.4. Minimal charter capital requirements

In 1991 the CBR determined in its first instruction the minimal charter capital of banks. There were different requirements for the different types of banks :
-       Commercial banks, organised as companies with limited liability of the closed type had a capital requirement of 5 million rubles.
-       Commercial banks, organised as stock companies of the open type had a capital requirement of 25 million rubles.
-       In individual cases, when banks were founded by small enterprises, cooperatives, other alike organisations or individuals, the requirement was only 0.5 million rubles.

These requirements were changed twice in the period under study:
-       In august 1992 the CBR rose the charter capital requirement to 100 million rubles. This was as a matter of fact only an adjustment of the requirement to the inflation shock in early 1992.
-       From March 1994 on newly founded banks had to satisfy a charter capital requirement of 1 million ECU, which was at that time 2 billion rubles. The CBR also stipulated that there would be a quarterly correction of this minimal capital requirement in rubles in order to keep up with the value of 1 million ECU. Note however that these requirements were only obligatory for newly founded banks (Vasilishen, 1995, p. 36).
Some banks were excluded from these general requirements and were subject to individual requirements for several specific reasons.

In table III.2 we show the structure of the commercial banking sector according to required charter capital. The table shows the effect of the new law in March 1994. The strong growth in the class 1 billion rubles - 5 billion rubles with 505 banks since March 1994 (from 9.3% of the total to 27.7% of the total) is largely explained by the foundation of new banks (442 since March 1994) that were subject to the requirement of 1 million ECU. An important inference from table III.2. is that several banks did not comply with the minimal capital requirement, apparently without being sanctioned by the CBR. This is remarkable since a nominal charter capital requirement is the most simple regulation to enforce. It suffices to read the balance without any further calculations to see whether a particular bank satisfies the requirement or not. Nevertheless the CBR started only on 1 October 1994 with the withdrawal of registrations and licences of banks that did not comply with this simple rule (Vasilishen, 1995, p. 36). This supports our earlier conclusion that in 1992-1994 prudential control was very weak, no matter how strong or weak the prudential regulation may have been.

Table III.2. cannot give any indication of whether Russian banks are lowly capitalised or rather highly capitalised. The fact that 50 % of the banks had a small capital of less than 500 million rubles by end 1994, which at that time equalled only 115,821 ECU[5], is low compared to the OECD average[6], but does not automatically mean that these banks are poorly capitalised. Bank capital may be low, but this is no problem if the scale of banks is even lower. Maybe banks are so small that capital adequacy is still reasonably high.

Table III.2. Classification of Russian commercial banks according to their charter capital

Date	1.01.94	1.03.94	1.07.94	1.01.95
Capital				
< 100 mln. rubl.	272	208	132	93
share in %	13.5%	10.0%	5.8%	3.7%
100 mln. - 500 mln. rubl.	1320	1343	1323	1160
share in %	65.4%	64.7%	57.7%	46.1%
500 mln. - 1 bln. rubl.	261	293	379	403
share in %	12.9%	14.1%	16.5%	16.0%
1bln. - 5 bln. rubl.	138	193	389	698
share in %	6.8%	9.3%	17.0%	27.7%
> 5 bln. rubl.	28	38	71	163
share in %	1.4%	1.8%	3.1%	6.5%
Total number of banks	2019	2075	2294	2517

Source : CBR, 1995, Bulletin of Bank Statistics, No. 1(20), p.9, table 5

1.5. Capital adequacy

The CBR put in place two norms for capital adequacy in 1991[7]. The first norm (N1) is analogous to the Cooke-ratio for capital adequacy. N1 requires that the capital of the bank is at least 4 % of risk-weighed assets, compared with 8% in the Cooke-ratio and even higher conventional market levels. The second norm (N2) requires that capital is at least 10% of risk-weighed assets of the higher risk classes. The precise definition of these norms is elaborated in Androsov (1995). It is clear that capital adequacy requirements are low, compared to international standards. Still we cannot conclude that Russian banks are undercapitalised since norms only show the minimal requirement and not the actual state of affairs. We will analyse the capitalisation of Russian banks in the next section.

2. Capitalisation of the Russian banks

2.1. General

The capitalisation of commercial banks is an important indicator of the health of any banking system. A strong capital base is a buffer that guarantees the stability of the bank and the safety of its obligations, notably to depositors and other banks. Undercapitalised banks face a large capital risk. This has implications for deposit markets, interbank markets and for the stability of the financial system as a whole. For this reason banking regulation has the last years focussed on capital requirements. There has been some international harmonisation of capital regulation

thanks to the catalyst effect of the Basle accords of 1988. In these accords several industrialised countries, members of the BIS, agreed on the adoption of a common measure of solvency, namely risk-weighed capital adequacy. The requirements provided in the accords or close substitutes were subsequently installed in most industrialised countries. The accords are analysed in depth by Barbour, Norton and Penn (1991) and Hall (1993). Precisely undercapitalisation also tends to be one of the main problems of young banking systems. This is not different in Russia. There is a large literature on these matters, but most of it does not fit the specific situation of transition. In transition countries there is the specific problem of uncertainty about the quality of loan portfolios, with consequently a looming problem of hidden undercapitalisation.

2.2. Descriptive statistics

We adopt an empirical approach to determine whether Russian banks are indeed undercapitalised. We use subsample B(1994) for this analysis. Our objective is to find out whether capitalisation is low or high, which banks are possibly undercapitalised and whether this constitutes a danger to the financial system.

Ideally, we would like to analyse the capital adequacy of the banks in sample B(1994). However our data are not detailed enough to construct the value of risk-weighed assets. Therefore we divide capital by total assets. In this way we get a minimum estimate for capital adequacy, since all assets are weighed at 100%. We calculate two versions of this variable:

CAPAD1 = Charter capital / total assets
CAPAD2 = (Charter capital + reserves) / total assets

The descriptive statistics in table III.3 learn that the average of both variables is, contrary to expectations, quite high, namely 6.63 for CAPAD1 and 12.06 for CAPAD2. So the average capitalisation of Russian banks appears to be satisfactory. This average is however not a weighted average and hence it pays too much attention to relatively small banks. Further scrutiny learns that there still may be a problem of undercapitalisation at the lower end of the frequency distribution. Table III.3 shows that the sample distributions of both variables are seriously skewed. The medians are already a lot lower than the averages with respectively 3.44 and 8.56. For CAPAD1 the category with the highest frequency turns out to be the lowest category (0-2.5) and for CAPAD2 the category 5-7.5 has the highest frequency. Skewness, kurtosis and Jarque-Bera, all testify of the distinct non-normality of both indicators.

One is tempted to assume that the banks at the lower end of the capital adequacy distribution are precisely the small and inactive banks that will disappear or be acquired anyway. If that is true, the low capitalisation of the small banks may have no significant impact on the capitalisation of the banking system as a whole. The problem can then be neglected because the capitalisation of the banking system is closer to the average than to the median. Unfortunately this assumption is wrong as will be shown in the next section. Indeed the empirical analysis in the next section finds that the banks with low capitalisation are precisely the larger banks, which grant most credits and have the largest deposit base. Therefore there indeed exists a problem of undercapitalisation as set out in the next section. This can also be seen directly from the weighted averages of CAPAD1 and CAPAD2, that are respectively 2.87 and 8.5.

Table III.3. Descriptive statistics of capitalisation in sample B(94)

Series: CAPAD1	
Sample 1 230	
Observations 230	
Mean	0.066295
Median	0.034432
Maximum	0.686422
Minimum	4.47E-05
Std. Dev.	0.091249
Skewness	3.381463
Kurtosis	18.07772
Jarque-Bera	2616.966
Probability	0.000000

Series: CAPAD2	
Sample 1 230	
Observations 230	
Mean	0.120607
Median	0.085618
Maximum	0.717457
Minimum	0.009153
Std. Dev.	0.107073
Skewness	2.723797
Kurtosis	12.10489
Jarque-Bera	1078.847
Probability	0.000000

2.3. Empirical analysis of capitalisation

2.3.1. Looking for the determinants of capitalisation

The independent variables are off course CAPAD1 and CAPAD2. We want to detect which banks are at the lower end of the capitalisation distribution. The first relation to be checked is the relation between capitalisation and the bank's type. For this purpose we use our three main dummy variables on the type of the banks, namely STATE, MOSCOW and NATREG. But what is the expected influence on capitalisation of the bank's type ? We expect that capitalisation will be higher in **Moscow**. Moscow is the financial capital and shows a relative financial abundance. Also most Russian banks with international connections are located in Moscow. This willingness to expand their international networks may urge these banks to conform to international capital standards and have high degrees of capitalisation. **State** banks are expected

to have lower capital because they have to deal with a communist legacy of bad loans (see chapter V) and a capital base from before the price liberalisation and because they are too inflexible to recapitalise by raising additional equity. **National or regional** banks are expected to have higher capitalisation than average because they are better placed to raise additional capital[8].

Next it is interesting to look for the fundamentals that may explain the capitalisation of a bank. Some of these fundamentals may by correlated to the type of banks. It is clear that the **age** of the bank may play a role. First of all, because of the law of March 1994 that rose required capital but only for newly founded banks (see 1.1.). Second, there is a certain amount of stickiness attached to charter capital in the short run. Issuing new shares is not a simple task and therefore charter capital will adjust only slowly to inflation. Thus younger banks will on average have higher nominal capital. A second factor that may play a role is **scale**. We expect that scale and capitalisation will be negatively related for two reasons. We suspect that a lot of banks have grown without changing equity capital, but still satisfying capital adequacy. This is because at the time of foundation most banks largely satisfy capital adequacy (the minimal capital requirement dominates the capital adequacy requirement due to the initial small scale of most banks). We are also interested in the relation between **deposits** and capital. Since capital adequacy requirements are weak and not enforced, and since market valuations of the riskiness of a bank are so far not based on the capital adequacy of the bank, it may very well be that Russian banks consider capital and deposits to be alternative sources of funds that can be freely substituted. One of the reasons why we expect this **substitution** to root in Russia is the extremely high dividend ratios in Russian banking. Many banks were established by large enterprises or organisations with the explicit purpose to supply the founders with cheap credits and to earn easy money for them in the exchange rate bonanza of 1992-1994 (see section 6). This is mirrored in very high payout ratios. In table III.4. we show the distribution of the payout ratio (not reserved profits/total profit = DIVRAT) in sample B(1994). Table III.4. shows the tendency of Russian banks to pay dividends rather than retain earnings. Of the 230 banks in the sample only 49 banks (21.3%) had a payout ratio smaller than 50% or in other words reserved at least 50% of their profits. The mean is 79.5% and the median is 99.6%. Indeed about half of the banks distribute all their profits or even more. When DIVRAT is larger than 1, the bank is actually consuming equity to pay dividends. These high payout ratios make capital very costly. This is in stark contrast to Western banks, where the retaining of profit is an important source of capital growth (see Kaufman, 1992).

The empirical question is whether deposits and capital are substitutes or rather complements in the Russian banking environment. Since we expect them to be substitutes, we predict a negative relationship between **deposits** and capital. Russian banks minimise the costs of funding. They can substitute deposits for capital with two constraints : There is a nominal minimal capital requirement to be respected and there may exist a bank-determined upper bound to the share of deposits, function of for example the scale of the bank, its branch network and its reputation with savers. Making abstraction from these constraints, the substitution is function of the relative prices of capital and deposits. For the cost of deposits we use the **deposit interest rate**. We expect a positive relation with the capitalisation of the bank. The cost of capital is largely determined by the dividend policy of the bank. As a proxy variable of dividend policy we use the **payout ratio**, which should be negatively related to the capitalisation of the bank.

Table III.4. The payout ratio of Russian banks in sample B(94)

Series: DIVRAT
Sample 1 230
Observations 230

Mean	0.795339
Median	0.995819
Maximum	3.291175
Minimum	0.000000
Std. Dev.	0.398256
Skewness	0.986817
Kurtosis	12.11646
Jarque-Bera	833.7988
Probability	0.000000
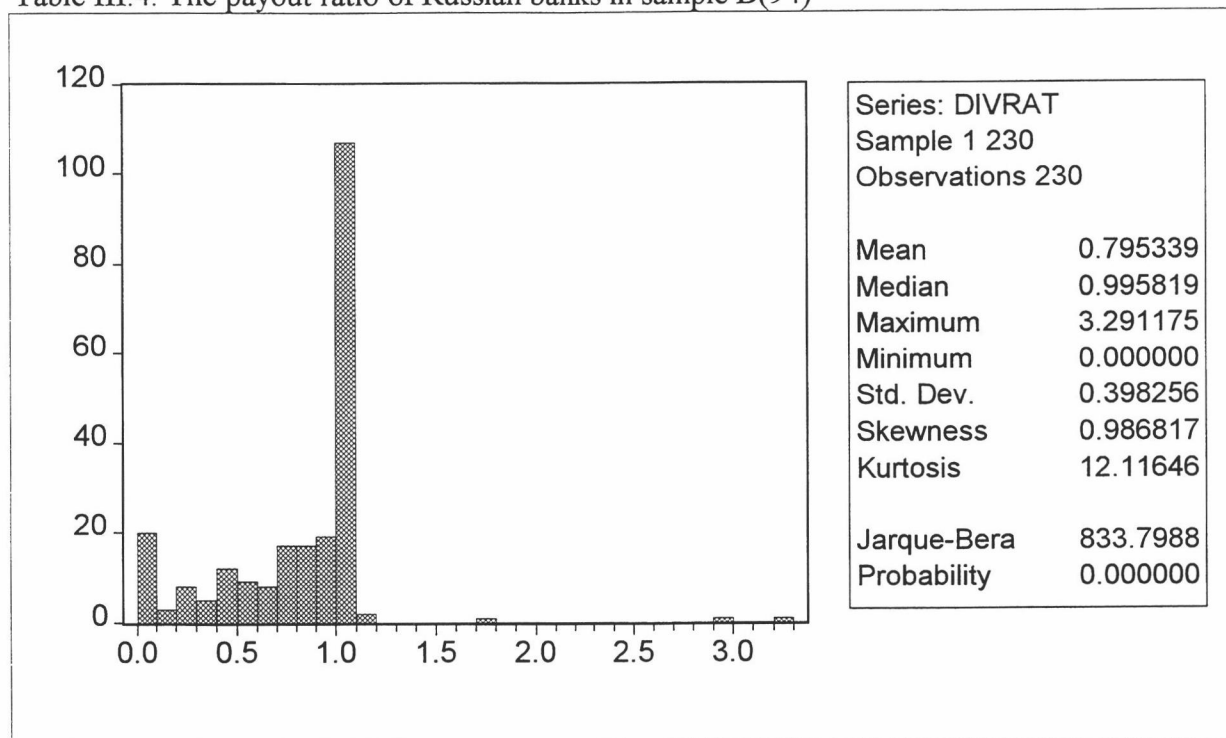
Variables that affect the bank-determined upper bound on deposits do not have to be included since they are implicitly present in the variable on deposits. We will analyse them later more in detail, when we turn our attention to deposits.

2.3.2. Variables and methodology

We perform an OLS regression of the dependent variables CAPAD1 and CAPAD2 on the dummy variables (equation No.1), then we add the other variables (equation No.2). In equation No. 3 we removed the variables that have become insignificant. Deposits as a share of assets is excluded for methodological reasons. We found a highly significant negative relation between capitalisation and deposits, but one could argue that this is due to the linear relation between deposits and the dependent variable. This linear relation follows from an accounting identity (the sum of all shares of various liabilities in total liabilities by definition equals 1).

We use the following dependent variables :

CAPAD1 = charter capital / total assets,
CAPAD2 = (charter capital + reserves) / total assets,

and the following independent variables :

STATE, NATREG and MOSCOW are dummies
LOGSCALE = ln(total assets)
LOGAGE = log(age of the bank in years)
DEPIR = deposit interest rate = (interest paid/interest bearing liabilities)
DIVRAT = dividend ratio = (profit-reserved profit)/profit

2.3.3. Presentation of results and interpretation

Table III.5. Regression results on the capitalisation of Russian commercial banks

Panel a. Independent variable = CAPAD1

No.	1	2	3
C	0.073 ***	0.294 ***	0.283 ***
	(10.49; 0.000)	(7.902; 0.000)	(8.620; 0.000)
STATE	-0.033 ***	-0.009	
	(-5.31; 0.000)	(-1.56; 0.120)	
NATREG	-0.035 ***	0.011	
	(-4.599; 0.000)	(1.467; 0.142)	
MOSCOW	0.017 *	0.026 ***	0.029 ***
	(1.831; 0.068)	(2.922; 0.0038)	(3.394; 0.001)
LOGAGE		-0.043 ***	-0.043 ***
		(-4.402; 0.000)	(-4.439; 0.000)
LOGSCALE		-0.016 ***	-0.016 ***
		(-5.611; 0.000)	(-6.183; 0.000)
DEPIR		0.035 *	0.038 **
		(1.821; 0.070)	(2.040; 0.043)
DIVRAT		-0.0297 ***	-0.031 ***
		(-2.652; 0.0086)	(-2.777; 0.006)
Adjusted R²	0.137	0.462	0.462
F-Statistic	13.182	29.044	40.368

Panel b. Independent variable = CAPAD2

No.	1	2	3
C	0.120 ***	0.385 ***	0.371 ***
	(15.629; 0.000)	(7.996; 0.000)	(8.849; 0.000)
STATE	-0.032 ***	-0.008	
	(-3.744; 0.000)	(-0.831; 0.407)	
NATREG	-0.037 ***	0.012	
	(-3.871; 0.000)	(1.096; 0.274)	
MOSCOW	0.030 ***	0.04 ***	0.042 ***
	(2.760; 0.0063)	(3.43; 0.001)	(3.849; 0.000)
LOGAGE		-0.032 **	-0.032 **
		(-5.237; 0.016)	(-2.441; 0.015)
LOGSCALE		-0.02 ***	-0.019 ***
		(-5.265; 0.000)	(-6.025; 0.000)
DEPIR		0.019	0.027
		(0.79; 0.43)	(0.976; 0.33)
DIVRAT		-0.036 ***	-0.038 ***
		(-2.882; 0.0043)	(-3.021; 0.003)
Adjusted R²	0.127	0.347	0.350
F-statistic	12.109	18.415	25.699

White heteroskedasticity-consistent standard errors & covariance
For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.
T-statistics and t-probability are in brackets

At first sight Russian banks seemed to be well capitalised. The results in table III.5 reveal that there may nevertheless be a structural undercapitalisation problem in the Russian banking market. We observe that the dummies on the banks' type were initially significant (equation No. 1 in both panels) but lost significance with the introduction of the other variables (equation No.2 in both panels). This assures us that the other variables represent the underlying model that explains capitalisation. The exception is MOSCOW, which is significant for all equations in both panels. Apparently Moscow-based banks are better capitalised than other banks. The fact that scale and age are inversely related to capitalisation (see equations No. 2 and No. 3 in both panels) shows that the oldest and largest banks (that manage the largest deposit bases), are worst capitalised. The buffer of capital that protects depositors against credit risk is fairly small in exactly these banks where such a buffer is needed. This is at least partially due to the process of substitution of deposits for capital. Controlling for scale and age we found that the cost of capital and the deposit rate (cost of deposits) explain charter capital very well and in a way that supports the idea of substitution between capital and deposits. This can be seen from panel a, equation No. 2 and No. 3, where the deposit interest rate and the dividend ratio are both significant and show the sign, needed for substitution. In panel b, we see that the deposit rate is not a significant predictor of CAPAD2, but the cost of capital still is. By end 1994 this substitution mechanism constituted a serious risk to the stability of the banking system[9].

3. Bank deposits

3.1. Introduction

In a market economy savings are a substitution of future consumption for actual consumption. Saving is smoothing consumption patterns over time. Consumers have a time preference for actual consumption over future consumption. Therefore, in order to urge consumers to store value in savings, real interest rates have to be positive. One should keep in mind that in the end one stores value for future consumption, be it personal consumption, consumption of relatives or consumption of heirs in the case of inter-generational transfers. Therefore the store of value must be convertible into consumption at any future point in time. It must have some level of liquidity. If a store of value cannot offer the prospect of positive real interest rates and minimal liquidity, economic theory predicts that rational agents will substitute it for other stores of value. A first version of this idea can be found in Gresham's law[10]. Savers prefer good money to bad money for the purpose of storing value. Recent research on currency substitution (see for example Guidotti and Rodriguez, 1992) has shown that Gresham's law can be extended to transactions money in the case of two competing paper moneys, say the ruble and the dollar. So while Gresham's law implied that bad money drives good money out of circulation in the case of coins with intrinsic value, the reverse holds for paper money : Good money drives out bad money both as a store of value and as transactions money.

In the communist system there existed no appropriate store of value. Shares nor bonds did exist, excluded some government bonds that earned almost no interest and were often compulsory. People were not entitled to own houses, ground or other real estate, exception made for the typical dacha, a summer-house with a garden for potatoes, fruits and vegetables. The only way of storing value was to save money on an account in the Savings Bank or buy government bonds. However, since the demand for products was consistently higher than supply and prices were fixed, these saving accounts and government bonds should not be considered as deliberate

stores of value but as the only possible destination for the surplus of money. On the aggregate level, the increasing stock of savings (in % of GDP) could never be spent on consumption because current supply of consumption products was deficient. The literature refers to this phenomenon as forced savings and monetary overhang (stock of forced savings). We devoted attention to this topic in chapter II.

The first effective stores of value that became widely available were cash dollars. In fact the dollarisation of the Russian economy began already in the late eighties. At that time dollars were the predominant store of value because there existed almost no domestic dollar inflation and dollars gave entrance to special dollar shops that never faced deficient supply, thus solving the problem of inconvertibility in goods. In general foreign currency or more specifically dollars offered a better hedge against inflation, be it open or hidden, than rubles. The high inflation of 1992-1993 made foreign currency, foremost dollars and marks, even more important. The new commercial banks, as could be expected, stimulated this evolution. Indeed the first financial market that functioned properly was the Moscow Interbank Currency Exchange (MICEX). Currency exchange was one of the core activities of banks in the early years and as a matter of fact a lot of banks really started as currency traders and developed only later other bank operations. Currently the dollarisation of the Russian economy has reached an amazing scale (see next section).

It is also of crucial importance that the commercial banks are able to attract ruble deposits. Literature on conventional market banking sheds some light on the possible problems. Deposits are of crucial importance to banks, but they also constitute a **systemic risk.** Banks do not hold enough liquid resources to pay all depositors back at the same time. The very concept of banking is based on the observation that not all depositors withdraw money at the same moment. Banks only hold a tiny % of deposits to cover withdrawals and use the rest to finance investments. Therefore there is always a risk that a real or perceived crisis of a specific bank triggers a bank run, which can spill over to other banks and create a systemic crisis. The literature suggests that this may be solved by a system of properly priced deposit insurance. In Russia there was no explicit deposit insurance in 1992-1994, but we will show in chapter V that the system of required reservation actually functioned as an implicit system of deposit insurance.

Practice however learned that deposit insurance by itself will not automatically prevent systemic crises. Merton (1977) and Kareken and Wallace (1978) showed that deposit insurance will urge banks to assume more risk, unless insurance premiums are related to the expected cost of failure to the insurance system (so risk-related). O'Driscoll (1988), Keeley (1990), Mishkin (1992) and many others analysed the relation between deposit insurance and the wave of bank failures in the US since the early eighties. They find evidence that deposit insurance indeed contributed to the wave of failures. Kane (1989) blamed government policy, including deposit insurance but also inadequate regulation and supervision, political interference, and inability to promptly close insolvent institutions, for the wave of bank and savings and loan (S&L) failures since 1980 in the US. So analysis has shown that deposit insurance is not enough. It must be properly priced and it must be accompanied by appropriate regulation and prudential control, two disaster zones in the early Russian banking environment as shown in section 1 above.

3.2. Currency substitution or the dollarisation of the Russian economy

3.2.1. General

Currency substitution is the displacement of local national currencies by one of the important world currencies, say the dollar or the German mark. When the displacing currency is the dollar, currency substitution is commonly referred to as dollarisation, which is typically the case in Russia. The process of currency substitution has been studied in the literature. Early research emphasised the role of money as a store of value and considered dollarisation to be a phenomenon of optimal portfolio composition in an open world (see for example Calvo and Rodriguez (1977) and Girton and Roper (1981)). Later on the literature also considered currency substitution in the sphere of transaction demand for money, as in Calvo (1985), Guidotti (1989) and Vegh (1989). In all this literature currency substitution emerges as a normal market response to changes in the relative rates of return of competing currencies. This means that these theories predict the reversal of dollarisation once the rates of return go back to their original values. This prediction is at odds with the empirical observation of hysteresis of currency substitution in many Latin American countries: Once dollarisation has started it is not easily reversed. The first paper that explains analytically this hysteresis is Guidotti and Rodriguez (1992). They build an interesting model and derive from it the existence of an inaction band. This inaction band postpones dollarisation, but once the process of dollarisation has started, the inaction band also hampers the reversing of dollarisation (say 'de-dollarisation'). Their model allows for the irreversibility of dollarisation and explains why dollarisation is such a dangerous phenomenon.

Dollarisation can take several forms. The most threatening form of dollarisation is capital flight or currency flight which means that currency is leaving the country and deposited abroad. A second form of dollarisation is the domestic substitution of dollars for rubles, both for cash and non-cash. In Russia this amounts to higher dollar deposits in Russian banks and higher holdings of cash dollars by the Russian population and enterprises at the cost of lower ruble deposits and ruble holdings. In Russia both forms of dollarisation, capital flight and domestic substitution, started already in the period of perestroika under Gorbachev. Below we will analyse in detail how both forms of dollarisation developed in Russia.

3.2.2. Capital flight

Capital flight is the flow of Russian wealth abroad, mostly to currency holdings on foreign bank accounts. The economic rationale for capital flight is political and economic uncertainty. This uncertainty already emerged under the old system, but the strict centralisation of foreign trade and foreign exchange was a strong barrier to capital flight. Exporting firms did not have direct contact with the Western importers and did not receive the earned currency, but only the corresponding amount of rubles. The exchange rate was determined by the state. Handling foreign currency was strictly limited to some state agents. See Nove (1986) Gregory and Stuart (1990) and IMF and others (1991) for an overview of the Soviet system of foreign trade and foreign exchange. This situation changed gradually with the liberalisation of foreign trade and the exchange system during perestroika. A complex system of surrender requirements or retention quota was set up. Initially this meant that enterprises received a small % of their currency earnings. With the liberalisation of foreign trade, enterprises received the currency first and then had to surrender a share of it to the state or the CBR. This was combined with a

frequently changing and complex system of differential exchange rates and surrender requirements. A fairly complete overview of this system is given by Granville (1995). From July 1992 the multiple exchange rate system was ended. Enterprises were required to sell 20% of their currency earnings on the Moscow Interbank Currency Exchange (MICEX) and 30% to the CBR. This still meant implicit taxation because the CBR used the MICEX rate of the day of the sale, but only paid the rubles due some time later, when the ruble had depreciated further. In July 1993 this system was altered again. From then on enterprises were required to sell 50% of their currency holdings at MICEX. Officially repatriation requirements remained all the time at 100%. So in theory all capital flight was illegal. In practice the customs services were not able to enforce the regulations. The system changed too abruptly and too frequently for the new administration to keep up. Therefore we argue that Russian capital flight was largely trade related.

A first channel of capital flight is export. The existence of substantial export taxes was an additional incentive to cheat on export. There are four ways to cheat on export, namely underinvoicing official export, completely unregistered export (smuggle), CIS export and barter. By underinvoicing we mean that a Russian exporter officially charges prices below world market level and receives some of the difference on a bank account in the West. Second, a large but unknown share of foreign trade was unregistered in the late eighties and the early nineties. Third, a Russian exporter can export to a CIS-country at subsidised low prices and then re-export from that CIS-country to world markets, using the CIS-country as an intermediary. Proof of such schemes can be found in the fact that some of the CIS-exporters in 1992 suddenly became exporters of primary products, of which they had no production. Last, barter trade also offers opportunities to divert some wealth abroad. In the case of export related capital flight, 'capital flight' might in fact be misleading terminology. Most of the export related flight capital has never even entered Russia. Non-repatriation of currency income is a better name.

A second important channel is import. Cheating on import is mainly achieved by double-invoicing. One part of the invoice then goes to the foreign supplier, another part to the foreign bank account of the Russian importer. Sometimes payment was effected and the foreign supplier did not 'deliver', officially leaving the importer with a loss, but in reality just masking capital flight. In practice such situations were in many cases a hidden capital flight, stuffing foreign bank accounts of enterprise managers at the cost of wage, tax and bank arrears.

Export of cash is only a minor source of capital flight.

The hidden character of the capital flight, makes it difficult to make a reliable estimate of its scale. The press and the literature have put forward various and widely divergent estimates. Tikhomorov (1997) gives a good overview of these estimates. He summarises estimates from all sources (Russian government, CBR, Russian parliament, BIS, IBRD, IMF, OECD, etc.). Then he adds his own estimates which are based on reasonable assumption. We repeat his findings in table III.6. From this table we observe that capital flight may be uncertain, but also that its scale is with certainty substantial. This has serious consequences for the domestic economy. A large amount of capital is invested abroad, often simply on bank accounts, while the domestic need for investment finance and liquidity is huge.

Table III.6 Various estimates of capital flight from Russia (in bn US dollars)

	1991	1992	1993	1994	1995	91-95	90-95
Minimum	1.0	2.5	5.0	2.5	5.0	16.0	35
Medium	8.2	13.0	8.0	17.0	12.0	58.2	50
Maximum	15.5	20.0	17.0	42.4	30.0	124.9	400
Tikhomirov		11.0	13.1	19.7	18.5	62.2	

Source : Tikhomirov (1997), pp. 603 and 608

Capital flight has important consequences for the domestic economy. For example in 1994 Tikhomirov estimated a capital flight of 19.7 bn US dollars. Aggregated capital flight till 1994 amounted to 52 bn dollars[11]. This equals in rubles correspondingly 45.1 tn rubles and 119 tn rubles in 1994[12]. When we compare these numbers to the outstanding credits of banks to the economy by end 1994 (64 tn rubles) and investment in 1994 (106.2 tn rubles) the scale of capital flight becomes clear[13]. We will not analyse capital flight in detail, because most of it has been realised without interference of the commercial banking system, which is our focal point. Here it suffices to say that the scale of capital flight is an illustration of the inability of banks to collect the savings in the economy.

Within Russia, currency has been replacing rubles too. This is true for both cash and non-cash rubles. Domestic dollarisation is far more interesting than capital flight because of the active role of Russian commercial banks.

3.2.3. Dollarisation of deposits

3.2.3.1. General

As far as the dollarisation of deposits is concerned, we observe from table III.7. that dollar deposits grew substantially during our period of study. Table III.7. also shows that the dollarisation of bank deposits started before the price liberalisation of January 1992. Currency deposits in December 1991 were already substantial when compared to ruble deposits. This is even more so if one takes into account that ruble deposits were inflated artificially because of the monetary overhang. In the first quarter of 1992 the ratio currency deposits/ruble deposits increased not really excessively, notwithstanding high inflation. The real shock came in the second quarter of 1992. Inspection of monthly details -not reported here- learns that the main shock happened in May 1992. In that month nominal ruble deposits increased with only 1.7%, while nominal ruble denominated currency deposits increased with more than 50 %. Taking into account that the nominal ruble/dollar exchange rate decreased substantially in May 1992[14], we find that nominal dollar denominated currency deposits even must have risen with substantially more than 50%. From then on dollarisation of deposits increased to reach its peak in the first half of 1993. Then the trend was apparently reversed. By end 1994 dollarisation of deposits was at around 30%[15].

The dollarisation of deposits was stimulated by the discriminatory influence of required reserves, as analysed more in detail in chapter V. In early 1992 the CBR imposed high reserve require-

ments on ruble deposits (15% on short term deposits, 10 % on long term deposits). In March 1994 these requirements were strengthened to 20% and 15% correspondingly. These requirements were to be held at the CBR at zero interest rate. Currency deposits were however exempted from required reservation. Therefore the system of required reservation was equivalent to discriminatory taxation of ruble deposits, in favour of dollar deposits. This constituted an additional incentive for banks to substitute currency deposits for ruble deposits, as much as possible. Reserve requirements on currency deposits were only imposed in January 1995 at a low 2%, but at the same time ruble requirements were also lifted. In fact the discrimination was hardly affected by the change. There were many small changes to the requirements later on but only in November 1996 there was change with significant implications. On 1 November 1996 ruble requirements were lowered to 16% (less than 1 month), 13% (1-3 months) and 10% (more than 3 months), while the currency requirement was lifted to 5%[16]. This approximately halved the discrimination.

Table III.7. The dollarisation of deposits

| | Ruble deposits | | Currency deposits | |
	in bn rubles	in % of total	in bn rubles	in % of total
December 1991	831	80.4 %	203	19.6 %
Q1 1992	1066	77.0 %	319	23.0 %
Q2 1992	1476	63.4 %	852	36.6 %
Q3 1992	3268	56.3 %	2534	43.7 %
Q4 1992	4372	49.1 %	4538	50.9 %
Q1 1993	6354	45.3 %	7671	54.7 %
Q2 1993	10652	46.9 %	12053	53.1 %
Q3 1993	13362	53.9 %	11421	46.1 %
Q4 1993	18496	56.8 %	14080	43.2 %
Q1 1994	22883	51.4 %	21637	48.6 %
Q2 1994	34685	61.2 %	21952	38.8 %
Source : Granville (1995), statistical appendix				

Also the CBR plays a significant role in the deposit dollarisation. In view of the large scale of deposit dollarisation, it was crucial for banks to supply currency accounts and currency exchange to their customers. They were also urged to do so by the discriminatory reserve requirement policy of the CBR. However, not all banks were licensed by the CBR to perform currency transactions. In our period of study there existed three types of bank licences, namely in order of increasing power a simple registration, a foreign exchange licence and a general licence. Table III.8. shows the distribution of banks according to the licence type in 1994. We observe that far from all banks were allowed to perform currency transactions. This was not a major problem in 1992-1993, since the number of illegal currency exchange points was at that time huge. Later, the CBR enforced its rules and a lot of banks had to give up their currency transactions.

Table III.8 Licensing of banks by the CBR

Date	1.01.94	1.04.94	1.07.94	1.10.94	1.01.95
All banks	2019	2132	2294	2436	2517
of which have					
a foreign exchange licence	760	623	685	723	770
a general licence	169	185	202	222	242
Source : CBR, Bulletin of Bank Statistics, 1995, No. 1(20), table 4					

3.2.3.2. Bank-based analysis of dollarisation of deposits

In this section we analyse the dollarisation of the banks in sample A. For that purpose we calculate the share of currency deposits in total deposits. We name this ratio CURDEPS. The weighted average of CURDEPS in A was 30.9%, which is very close to the sectoral data of the CBR (see table III.7). This is reassuring with regard to the representativeness of A. The unweighted average was only 18.4% with a large standard deviation of 20.7%. This already indicates that the **scale** of banks is positively related to the share of currency deposits in total deposits.

Some other factors could play a role. First of all, the bank's type should be involved. Presumably **Moscow** banks will be more dollarised than other banks because Moscow was the centre of foreign activity in Russia. A considerable portion of the Moscow workforce is receiving wages in dollars. Also Moscow is hosting MICEX, by far the largest Russian currency exchange. In short, foreign currency as a scarce good is more abundant in Moscow than in the rest of the country. One of the main investments of dollar deposits is the interbank market which is also predominantly operating in Moscow. **National and regional** banks could be expected to have more dollarisation too, because of their association with scale. Last, we wonder whether **former state** banks attract more currency deposits due to the perceived safety of these banks or not.

Another way of looking at dollarisation is through reputation effects. One can expect that depositors would only deposit their foreign currency with banks they thoroughly trust. There are several indicators of the reputation or the quality of a bank. We propose as indicators the liquidity of the bank (LIQ), the scale of bad loans (BL), the quality of the loan portfolio (BLTL) and even the deposit interest rate (ID). Capitalisation is expected to be inversely related to currency deposits, given our findings in section 2 about the relation between deposits, scale and capitalisation. For LIQ we expect a positive coefficient. For BL and BLTL we obviously expect a negative sign. For ID we expect a negative sign too. We think that banks with a good reputation can both collect currency deposits and attract deposits at a lower cost. Below we will analyse more in detail the signalling function of deposit rates. The problem is that the proposed indicators are likely to be correlated, which leaves us with a problem of multicollinearity. The variables were defined as follows :

LIQ   = (excess reserves + GKO) / total assets
BL   = overdue loans / total assets (excluding interbank operations)
BLGL = overdue loans / performing loans (excluding interbank operations)
ID   = interest paid / interest bearing liabilities

We performed a simple OLS with dependent variable CURDEPS and independent variables STATE, MOSCOW, NATREG, LOGSCALE, LIQ, BL, BLTL, CAPAD1 and CAPAD2.

In a first equation we concentrate on the dummies. In equation No. 2 and 3 we add the other variables and try various significant combinations. It is straightforward that BL and BLTL are highly correlated, since they have an identical numerator. Therefore we use them in separate equations. An analogous argument can be made for CAPAD1 and CAPAD2.

We performed this regression of a subsample of A(1994). We only selected the banks that actually have currency deposits, in fact excluding the banks that have apparently no licence. This left us with a subsample of 104 banks (out of 126). Results are reported in table III.9.

Table III.9. Regression results on the dollarisation of deposits of Russian commercial banks

Independent variable = CURDEPS				
No.	1	2	3	4
C	-0.55			
	(-1.451; 0.163)			
STATE	-0.055	-0.021	-0.015	-0.008
	(-1.567; 0.12)	(-0.686; 0.494)	(-0.488; 0.627)	(-0.261; 0.795)
NATREG	-0.078 *	-0.082 **	-0.084 **	-0.078 **
	(-1.723; 0.088)	(-2.478; 0.015)	(-2.539; 0.012)	(-2.401; 0.018)
MOSCOW	0.142 **	0.093 *	0.098 *	0.057
	(2.498; 0.014)	(1.817; 0.072)	(1.935; 0.055)	(1.054; 0.294)
LOGSCALE	0.097 *	-0.05 ***	-0.049 ***	0.041 ***
	(1.914; 0.059)	(7.981; 0.000)	(7.923; 0.000)	(6.361; 0.000)
LIQ		-1.049 ***	- 1.035 ***	-0.972 ***
		(-4.424; 0.000)	(-4.304; 0.000)	(-4.247; 0.000)
ID		-0.135 **	-0.119 **	-0.090
		(-2.138; 0.035)	(2.037; 0.044)	(-1.46; 0.147)
BLTL		-0.202 **		-0.138
		(-2.399; 0.018)		(-1.648; 0.102)
BL			-0.582 **	
			(-2.236; 0.027)	
CAPAD1		-1.168 ***		-1.248 ***
		(-3.645; 0.000)		(-3.681; 0.004)
CAPAD2			-1.059 ***	
			(-3.289; 0.001)	
IBA				0.609 ***
				(2.894; 0.005)
Adjusted R²	0.235	0.374	0.370	0.426
F-Statistic	8.929	11.68	11.50	12.6

White heteroskedasticity-consistent standard errors & covariance
For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.
T-statistics and t-probability are in brackets

All variables are significant with the exception of STATE and the constant. Clearly, the safe reputation of state banks does not show on their ability to attract currency deposits. However, not all variables show the expected sign. It is remarkable that NATREG shows the opposite sign. This is not due to multicollinearity with LOGSCALE, since skipping LOGSCALE did not

change the sign of the coefficient of NATREG. We have no appropriate explanation for this. Also the liquidity variable does not show the expected sign. This may however be due to the non-linear relation between BL, BLTL and excess reserves identified in Chapter V, section 4.4. In that section we find that holding excess reserves may be associated with bad loan portfolios.

Moscow-based banks are indeed more dollarised than other banks. The fact that MOSCOW appears as a significant variable is however closely related to the fact that Moscow is the interbank market centre of Russia. Indeed, when we include interbank loans as a % of total assets (IBA), R^2 becomes higher and MOSCOW becomes insignificant (see equation No. 4). The significance of ID and BLTL is also adversely affected by the introduction of IBA, due to multicollinearity problems. Bad loans and loan quality have the expected negative reputation effect. The deposit rate seems to function as a signalling device for the banks. This signalling function of the deposit rate is analysed more in detail in section 3.4.2. Also capitalisation plays its expected but unusual role.

3.2.4. The substitution of cash dollars for cash rubles and ruble deposits

For the purpose of storing value many ordinary Russians prefer holding cash dollars 'under the pillow' to cash dollars on deposit accounts, let alone ruble assets. The literature teaches us that the reason for this dollar preference is the higher relative rate of return on dollars as a store of value. For the function of transaction money dollars have also become centrally important. Since inflation of dollar prices is lower than the inflation of ruble prices, living with dollars is more comfortable: For consumers dollar prices are more transparent and stable than ruble prices. Dollars are generally accepted, often at a beneficial exchange rate. Using dollars also means less coins and paper money than in the case of rubles. For sellers setting prices in dollars is cheaper because of lower menu costs. Moreover they prefer to receive dollars, since they are the superior store of value.

Moreover the criminalisation of Russian economic life plays a role here. Hidden, illegal or outright criminal activities have to remain unregistered. Agents in this part of the economy avoid bank payments and bank deposits, because these make them traceable. The option of depositing rubles and being compensated for inflation by positive real interest rates is thus not available as a store of value for these agents. They will certainly store in the form of cash, which leaves currency as the only viable option. In other ways the roles of money as a store of value and transaction money are closely linked in this case.

The Russian government at first tried to fight the dollarisation with laws. From January 1994 on it was forbidden to buy or sell products on domestic markets in any currency other than Russian rubles. The idea was to diminish the use of the dollar as transaction money and to canalise currency exchange to official currency markets. Only some banks are licensed to trade currencies. The new law indeed increased the liquidity of the exchange market and made the official exchange rate more representative. However, people continued to use currency for the purpose of storing value and as a means of exchange. Dollars continued to be accepted in practice on condition that nobody could observe the transaction. Practice showed that sometimes prices were listed and paid in dollars, but the receipt was denominated in rubles[17]. The dollarisation of the Russian economy reached very high levels in the second half of 1994 and stabilised at a high level in 1995, as shown in table III.10.

Table III.10. Quarterly expenditure of disposable money income[18]

	Q1/94	Q2/94	Q3/94	Q4/94	Q1/95	Q2/95	Q3/95	Q4/95
goods and services	77,0%	70,1%	70,5%	71,5%	75,7%	73,6%	76,7%	78,6%
savings and holdings	23,0%	29,9%	29,5%	28,5%	24,3%	26,4%	23,3%	21,4%
-savings	6,6%	8,9%	6,6%	4,8%	5,9%	7,2%	3,4%	3,7%
-purchase of currency	12,6%	12,7%	17,7%	20,4%	20,5%	11,4%	16,1%	16,0%
-ruble holdings	3,8%	8,3%	5,2%	3,2%	-2,2%	7,7%	3,8%	1,8%

Source : own calculations based on CBR, Bulletin of Bank Statistics, various issues

Unfortunately data on the purchase of currency by the Russian population become only available in 1994. In table III.10 we show data on the share of disposable income that is spent on the purchase of currency by the Russian population. The data are from the CBR and based on consolidated bank accounts. They are likely to underestimate the purchase of currency by the population, since in 1994 many illegal currency exchange offices were operating in Russia. The data give a good indication of the minimal scale of the dollarisation of the Russian economy. At the end of 1994 - begin 1995 more than 20% of disposable income was spent on currency purchases. In the last quarter of 1994 currency purchases amounted to more than 70% of total savings and holdings, in the first quarter of 1995 the ratio was even around 85 %. In some months the relation was even more extreme. This illustrates the disturbingly high scale of dollarisation by end 1994.

3.2.5. Empirical analysis of domestic dollarisation

3.2.5.1. Theoretical argument

The theory on dollarisation (see 3.2.1.) claims that the relative rates of return play a key role in the substitution process. These relative rates of return (r_t) are logically determined by inflation differentials ($\pi_t - \pi_t^*$), interest rate differentials ($i_t - i_t^*$) and the evolution of the exchange rate ($e_t - e_{t-1} / e_{t-1}$), with e_t the price of one dollar in Russian rubles at time t, π inflation, i the interest rate and * indicating the foreign currency. If $i_t - \pi_t - ((e_t - e_{t-1})/e_{t-1}) < i_t^* - \pi_t^*$, then people will substitute dollars for rubles, ceteris paribus. Guidotti and Rodriguez (1992) also include transaction costs and other imperfections that make the substitution costly and find proof for the existence of an 'inaction band' that explains the hysteresis and irreversibility observed in dollarisation processes in Latin America. To find out whether Russian dollarisation is also inertial, we include an autoregressive factor in our analysis.

3.2.5.2. Data and methodology

We do not use deposit data. Data on dollar deposits are available only in ruble terms, which means that they include an exchange rate term. However exchange rate variations are also one of the important exogenous variables to be included. This means that we are confronted with a huge endogeneity problem. Data on deposits also neglect the influence of cash dollars, which is far more important than the influence of dollar deposits. Therefore we use another dependent variable, namely the proportion of disposable income that is spent on the purchase of currency (USDSHARE), as measured by the CBR. These data capture the dollarisation of cash but they also largely capture the dollarisation of deposits, since this is effected mainly through the conversion of cash rubles into currency and the subsequent deposit in currency accounts.

There are no consistent data for the domestic dollar inflation rate π_t^*. The dollar interest rate i_t^* is very stable and can therefore be considered to be a constant. Considering this, the independent variables are dictated by 3.2.5.1. and include :

DEPREC $= e_t - e_{t-1} / e_{t-1}$

RUBLEI $= i_t$

INFLATION $= \pi_t$

and the lagged independent variable USDSHARE$_{t-1}$

More specifically, DEPREC is the end of month depreciation of the MICEX. RUBLEI is the Moscow interbank interest rate on credits for 1-3 months. USDSHARE is the monthly purchase of currency divided by monthly disposable income. INFLATION is monthly consumer price inflation. To assure consistency, we use for all variables the series reported by the CBR. The independent variable is only available from January 1994. While our period of study is 1992-1994, we are forced here to use data of 1994-1995 in order to assure a sufficiently large sample. We use 23 data points (January 1994 to November 1995).

Table III.11. Unit root test results for the data series

	Phillips-Perron		Augmented Dickey-Fuller	
	Test value	Critical values	Test value	Critical values
USDSHARE	-2.449758	1% -3.7667	-1.842915	1% -3.7856
		5% -3.0038		5% -3.0114
		10% -2.6417		10% -2.6457
d(USDSHARE)	-6.661084	1% -3.7856	-3.499929	1% -3.8067
		5% -3.0114		5% -3.0199
		10% -2.6457		10% -2.6502
INFLATION	-2.986907	1% -3.7667	-1.568656	1% -3.7856
		5% -3.0038		5% -3.0114
		10% -2.6417		10% -2.6457
d(INFLATION)	-5.143760	1% -3.7856	-3.330587	1% -3.8067
		5% -3.0114		5% -3.0199
		10% -2.6457		10% -2.6502
DEPREC	-3.319571	1% -3.7667	-1.939640	1% -3.7856
		5% -3.0038		5% -3.0114
		10% -2.6417		10% -2.6457
d(DEPREC)	-6.265584	1% -3.7856	-3.686350	1% -3.8067
		5% -3.0114		5% -3.0199
		10% -2.6457		10% -2.6502
RUBLEI	-0.913645	1% -3.7667	-1.290799	1% -3.7856
		5% -3.0038		5% -3.0114
		10% -2.6417		10% -2.6457
d(RUBLEI)	-3.227952	1% -3.7856	-2.733785	1% -3.8067
		5% -3.0114		5% -3.0199
		10% -2.6457		10% -2.6502

In order to avoid spurious regression, we tested for stationarity. Test results are reported in table III.11. Given the small sample size, we should attach more value to the Phillips-Perron results than to the augmented Dickey-Fuller results. For levels, the unit root hypothesis could not be rejected for any series. The unit root could be rejected however for the first difference with 1% significance (5% significance for d(RUBLEI)). The data series are thus I(1).

Given the small sample size it seemed unwise to apply the Johansen cointegration method for our I(1) data. Therefore we applied OLS to the first differences. The fact that for USDSHARE a unit root cannot be rejected, is already an indication of the inertia of dollarisation. Still we include a lagged independent variable to capture remaining autoregressive factors. We predict the coefficients for d(DEPREC), d(INFLATION) and d(RUBLEI) to be positive. The coefficient of the lagged dependent variable bears no a priori expectations.

Our variable RUBLEI might turn out to be insignificant, because we consider the dollarisation of cash and non-cash together. For the dollarisation of cash as transaction money, the domestic interest rate i_t plays no role, since the alternative is cash rubles, which do not bear i_t either. In that case only $e_t - e_{t-1} / e_{t-1}$ and π_t play a role. In fact the finding of an insignificant RUBLEI may indicate that the dollarisation of transaction money dominates the dollarisation of stores of value. It may also be due however to the fact that we do not work with deposit data, but cash data. Results are in table III.12.

3.2.5.3. Presentation of results and interpretation

Table III.12. Estimation results for the dollarisation of the Russian economy

Independent variable : USDSHARE			
Equation	No. 1	No.2	No.3
d(DEPREC)	0.233 **	0.230 *	0.245 **
	(2.147; 0.047)	(2.009; 0.061)	(2.236; 0.038)
d(INFLATION)	0.566 **	0.535 *	0.573 **
	(2.183; 0.043)	(1.854; 0.081)	(2.228; 0.039)
d(RUBLEI)		0.151	
		(0.326; 0.749)	
d(RUBLEI)$_{t-1}$	-0.350		
	(-0.880; 0.391)		
d(USDSHARE)$_{t-1}$	-0.263	-0.317 *	-0.298 *
	(-1.523; 0.146)	(-1.752; 0.098)	(-1.784; 0.091)
Adjusted R²	0.432038	0.409832	0.439139
F-statistic	6.071216	5.629558	8.829723
DW statistic	2.627650	2.418716	2.482164

For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.
T-statistics and t-probability are in brackets.

Neither the lagged variable for the interest rate (equation No. 1) nor the variable for the interest rate itself (equation No.2) were significant. The coefficient even showed the wrong sign in equation No. 2. Therefore we dropped the variable in equation No. 3. In equation No. 3 the coefficients for the variables on inflation and depreciation are significant at 5%-level and show the expected sign (equation No. 3). Also the lagged dependent variable was significant but only at the 10%-level. The sign of the coefficient was negative. This negative sign could be explained by the statistical phenomenon of mean reversion. The economic interpretation of mean reversion in this context could be overshooting behaviour of economic agents : Economic agents over-

shoot in their immediate reactions to depreciation and inflation innovations. DW-statistics are fine. Adjusted R^2 is reasonably high and the whole battery of stability tests did not show any problems with the stability of results.

We conclude that 1) relative rates of return indeed explain the Russian dollarisation and that 2) there are indications that the dollarisation of transaction money dominates the dollarisation of stores of value (as indicated by the insignificance of the interest rate). Additionally we find support for the hypotheses that 3) dollarisation is inertial (as indicated by the unit root tests) and that 4) Russian agents are showing overshooting behaviour (as shown by the mean reversion inherent in the negative sign of the lagged independent variable).

3.2.6. Effects of dollarisation on the Russian economy

There is almost no literature available on the effect of dollarisation in Russia. Brodsky (1997) is one of the first to give an overview. He builds a model for Russian dollarisation and finds, with the use of another methodology, that the expected rate of dollarisation is positively related to the difference between the rate of nominal depreciation of the ruble versus the dollar and the inflation rate and negatively related to the domestic interest rate. For our period of study Brodsky (1997) defines two periods of dollarisation, both of which were due to inappropriate and ineffective monetary and credit policies. The periods are 1992:2-1992:12 and 1993:12-1994:12. These periods are also identified in other studies as periods of destabilisation rather than stabilisation (see Åslund, 1993, Sachs, 1994). One of the crucial points is to understand that enterprises used the flow of credits and built-up arrears to suppliers, the budget or their workers to buy dollars and to convert them later into more rubles than they would have received from any ruble investment for the same period. These purely speculative profits were unsustainable but provided quite some banks and enterprises with the badly needed financial resources. We think that Brodsky forgets one important cause of the specific Russian dollarisation phenomenon, namely the criminalisation of the Russian economy. A substantial share of the national product is unregistered and is technically settled with cash dollars.

The first reliable estimates of dollarisation have appeared in 1995-1996. Observers claim that the degree of dollarisation has reached 30 to 40 % by end 1996.

One of the main adverse effects of a dollarisation equilibrium is that expansionary policies to stimulate economic activity are doomed to fail. The bulk of the resulting credit expansion would likely be converted into dollars and circulated in the financial sector, without having effect on the real economy, as happened in the second half of 1992 in Russia. Therefore the government can do nothing but wait for the reversal of expectations about GNP growth and try to stabilise inflation and the ruble exchange rate. In mid 1995 the exchange rate was stabilised by the introduction of a target zone for the exchange rate (the 'corridor'), that was later revised to a crawling target zone. If Russians would expect real GNP growth, stable prices and a stable exchange rate in the long run, they would start converting dollar holdings into rubles in order to invest in the domestic economy. This would initiate a virtuous circle. If people would start to trade dollars for rubles, then the ruble would appreciate against the dollar, inducing even more people to make the conversion. Interest rates would decrease, domestic money demand would rise and investment and economic growth would be stimulated. This would constitute the ultimate reward for Russia's stabilisation policy. But until people react in this way, the govern-

ment cannot do anything to kick-start the hoped for economic recovery. There even exists a paradox here. The export-oriented industries of gas, oil, energy, minerals and other natural resources seem to have the best chances to resume growth quickly. Also it is very appealing for the government to have these sectors growing, because they are large payers of corporate taxes (RET, 1997). The best way to stimulate these enterprises would seem to soften the crawling target zone exchange rate policy, which has induced a very gradual real appreciation of the ruble versus the dollar in 1996-1997. It is however exactly this policy that has stopped the dollarisation dynamics from July 1995 on. There thus is a large risk that abolishing the exchange rate corridor would simply trigger the dollarisation mechanism. We conclude that the government is trapped in the dollarisation equilibrium. The only policy that might succeed is to continue stabilisation and wait for the economic agents to adjust expectations and de-dollarise. In the meanwhile however the pressure on the government to ease monetary and credit policies is growing. If the government would give in, Russia would experience yet another round of dollarisation, rendering the next stabilisation package even more troublesome. The real danger behind this scenario is that, if people have experienced inflation and unsuccessful stabilisation policies long enough, then their expectations might become sticky. People's expectations of inflation and exchange rates might become inflexible. As a consequence they might develop 'living with inflation' strategies such as indexation of contracts and payment with cheques on interest-bearing saving accounts (as was the case in Brazil before the Real-plan). As a result there might emerge a Brazil-like equilibrium[19] with high inflation, that is to some extent inertial .

However, provisional data suggest that the de-dollarisation has started in the summer of 1997. There is a risk related to this de-dollarisation, as explained by Calvo and Rodriguez (1992). The remonetisation of the economy will increase credit supply and consumer demand and exert pressure on the price level and the trade balance. The policy instruments that could smoothen these effects are for example sterilisation, required reserves on local dollar deposits and restrictive fiscal policies. But remonetisation goes beyond the scope of our study.

3.3. Ruble deposits

3.3.1. General

The surprising severe inflation shock that struck after price liberalisation, together with the lack of competition in deposit markets and the weak monetary policy from June 1992 on (see chapter IV), caused negative real interest rates on ruble bank deposits during 1992-1993, as shown in table III.13. Real bank deposits decreased substantially as shown in table III.13. The table shows that real ruble deposits decreased strongly even after the initial inflation shock (see column 3), with the exception of the second half of 1992. In this period ruble deposits were accumulated due to the weak monetary policy of the central bank, which will be shown throughout this work. Real ruble deposit holdings seem to have bottomed out in the first quarter of 1994 and have been growing slowly since. This growth was stalled by end 1994, due to a financial crisis on the exchange rate market, but resumed afterwards. Note that according to RET saving of the population has decreased much slower than ruble deposits. Apparently Russians have been substituting other stores of value for ruble deposits. Foreign currency may be the most important of these substitutes, as shown in the previous sections.

Table III.13. Real deposit rates and ruble deposits

	monthly real deposit rate	indexes of real ruble deposits	
		Dec 1991 = 100	Q1/92 = 100
	(1)	(2)	(3)
Q1/92	-12.3	22	100
Q2/92	-8.1	20.7	93.8
Q3/92	-8.3	37.1	168.4
Q4/92	-14.9	22.1	100.3
Q1/93	-10.5	17	77.1
Q2/93	-8.7	16.9	76.7
Q3/93	-9.7	11.2	50.7
Q4/93	+0.1	9.9	44.8
Q1/94	+5.9	8.7	39.6
Q2/94	+3.7	10.8	48.8
Q3/94	-0.7	11.7	53.1
Q4/94	-3.6	11.5	52.2
Source : Granville (1995) and own calculations			

3.3.2. Individual deposits and the dominating position of Sberbank

It is crucial to find out whether the banks were able to build a sufficiently large deposit base. In this respect there is an important difference between the deposits from individual households and the deposits from enterprises.

Because of the inflation uncertainty, ruble velocity was very high and demand for ruble deposits very low. The commercial banks had to offer high interest rates to attract ruble deposits from individuals. This was foremost the case in the market of household deposits, because in this market the commercial banks had to compete with Sberbank. The extremely dominant position of Sberbank on the domestic deposit market was a serious threat to the developing commercial banks. Table III.14. shows that in 1992 the dominance of Sberbank must have been complete, since by the end of 1992 Sberbank still held 90 % of all individual ruble deposits. During 1993 the market share of the commercial banks steadily rose to reach a maximum by mid 1994 with a share of 57.3%. This was due to the strongly negative interest rates earned on Sberbank deposits during 1992-1993 and to the relatively higher interest rates offered by commercial banks. The depositors thus substantially substituted deposits with commercial banks for Sberbank deposits. The notion that a higher interest may be associated with higher risk had obviously not reached the mind of the average Russian saver by then.

By mid 1994 everything seemed to indicate that the market share of Sberbank would continue to crumble. However the trend was reversed and by end 1995 a new equilibrium had emerged with a market share of about one third for the commercial banks and about two thirds for Sberbank, as shown in table III.14.

Table III.14. Individual (household) ruble deposits in the Russian banking system

Date	Share of Sberbank	Share of commercial banks
1/01/93	90.0 %	9.6%
1/04/93	85.7 %	13.5 %
1/07/93	80.2 %	18.8 %
1/10/93	74.0 %	25.2 %
1/01/94	60.0 %	38.7 %
1/04/94	51.7 %	47.5 %
1/07/94	42.5 %	57.3 %
1/10/94	47.4 %	52.4 %
1/01/95	58.6 %	41.2 %
1/04/95	60.6 %	39.2 %
1/07/95	59.2 %	40.6 %
1/10/95	61.5 %	38.0 %
1/01/96	64.5 %	35.0 %

Source : CBR, Bulletin of Bank Statistics, various issues

The reversal of the downward trend in mid 1994 is most likely explained by a series of financial scandals and scams[20] that shocked the confidence of savers in commercial banks. After the point of reversal in mid 1994 we can distinguish two more financial shocks that strengthened the position of Sberbank. The first shock struck in the last quarter of 1994 when the market share of Sberbank jumped from 47.4% to 58.6%. Actually, if we look at the monthly data, the jump is from 47.4% by end September to 58.1% by end October[21]. This is probably explained by the crisis on the exchange market in October 1994, already mentioned in section 3.3.1. On October 11th of 1994 the ruble exchange rate collapsed with respect to the dollar. This caused a severe shock to the stability of financial markets. As a result of the crisis V.V. Gerashenko was forced to resign as chairman of the CBR[22]. On October 18th president Yeltsin appointed T. Paramonova as acting president of the CBR[23]. In the first half year of 1995 the market share of Sberbank seemed to stabilise at around 60%. However, there was a new, more gradual shock in the second half of 1995, when Sberbank's market share steadily rose from 59.4% in begin August to about 64.5% by end December. This was probably due to the severe crisis on the Moscow interbank market in August 1995 that led to the failure of a number of commercial banks in the second semester of 1995 (see section 4.).

The explanation for this dominant position is straightforward. First, Sberbank has for Russians been the only savings bank during the communist era. Therefore at the outset of reform every Russian disposed of a savings account with Sberbank. The **market share** of Sberbank was by definition 100%, because there were no competitors on the market of individual deposits. Second, this dominant market share is supported by a large **branch network** that is without competition the largest in the country. Sberbank inherited this enormous branch network from Soviet times[24]. Unlike the other former state banks Sberbank was able to keep its entire structure intact. Therefore it is the only commercial bank with a truly national coverage. In many places it is in fact the only bank available for depositors. Third, Sberbank is still a state-owned savings bank (the CBR is majority shareholder), that offers a **state guarantee** to small deposi-

tors. Therefore Sberbank is considered by savers as a safe heaven. The fact that financial shocks seem to strengthen the position of Sberbank is just a symptom of this. Savers have the justified conviction that Sberbank will never fail, while during early reform many commercial banks failed on their obligations or simply cheated and disappeared with the money[20]. This has caused a widespread feeling of distrust.

The data in table III.14. show that Sberbank's market share initially decreased sharply but then recovered quite strongly. The explanation for this is that a lot of savers were initially attracted by the high interest rates at commercial banks, but soon discovered that high interest rates were accompanied by high risk. As a consequence many returned to the safe Sberbank they knew from before. In short, Russian savers consider deposits with Sberbank as the **certainty equivalent** for the risky prospect of depositing with another bank. This implies that the interest rates offered by Sberbank are still leading the deposit market. They are a lower boundary for the interest offered by commercial banks. Add to this that ruble deposits with commercial banks bear severe reserve requirements, while Sberbank deposits are exempted from these requirements. This amounts to a discriminatory tax on commercial bank ruble deposits in favour of foreign currency deposits and Sberbank ruble deposits (see chapter V for more details on required reserves). This clarifies why ruble deposits with commercial banks are so low and why the share of Sberbank is so high.

3.3.3. Enterprise deposits

For enterprises the situation is different. A lot of enterprises have their own house-banks. They have inside information on the safety of these banks. These banks are often instruments for the enterprises to organise financing, to share in the profits of currency exchange and to settle payments. Therefore current accounts are the most important form of enterprise deposits at banks. For commercial banks current account deposits can thus be expected to be more important than individual deposits as a source of finance. This is supported by our bank data. We use sample A, because sample B does not specify the origin of deposits. Sample A does provide this specification, but only for ruble deposits.

In sample A(94) the weighted average of enterprise ruble deposits in total deposits was 58.3%, and conversely the share of individual ruble deposits was 41.7%. The unweighted averages were correspondingly 59.3% and 22.1% with standard deviations of 40.7% and 22.1%. This indicates that enterprise deposits are indeed more important than individual deposits, and that this dominance of enterprise deposits is typical for all banks, big or small.

3.4. Deposit interest rates

3.4.1. Some theory

It is common to assume that the demand for bank deposits (which is in effect the supply of credits to banks) is a positive function of interest rates offered by the bank. It is however even so common in the literature to reject this hypothesis in the case of bank loans. The supply of credits by a bank to a borrower is usually not directly driven by interest rates. The main reason for this are the adverse selection and adverse incentive properties of credit interest rates. Loans offered at higher interest bear a higher probability to fail, because the higher interest rates ex

ante select riskier projects and ex post urge the borrower to assume more risk. In developed capital markets this can lead to both a pooling equilibrium and a separating equilibrium with credit rationing. Various theoretical models have been developed to investigate the conditions under which a separating or rather a pooling equilibrium will develop in credit markets with asymmetric information. This has been done for example by Stiglitz and Weiss (1981), de Meza and Webb (1990), Hillier and Ibrahimo (1992), Boyd and Smith (1992), Smith (1994) and many others.

One could easily extend these models to deposit markets, by simply interpreting the depositor as the creditor, the bank as the entrepreneur and the quality of its loan portfolio as the quality of the project undertaken. Hence, it is far from certain that rational depositors will supply their deposits to banks which offer the highest interest rates (the pooling equilibrium). Theory learns that the separating equilibrium could produce. This reasoning may not hold in developed financial markets because of the solid protection of depositors. Deposits are protected by a wide range of measures, such as prudential regulation and control, deposit insurance and repeated bailouts in the case of isolated failures or systemic failures[25]. The probability of a bank failure is low and the probability that, in case of failure, deposits would be affected, is even lower. This has created a situation of widespread popular belief and trust in the safety of bank deposits. Therefore a separating equilibrium with adverse selection is not likely in developed deposit markets and depositors react to higher interest rates by supplying more deposits. The deposit rate elasticity of deposit supply is positive and quite high.

This pooling equilibrium in developed financial markets is also explained from a purely theoretical point of view. The rationale of the very existence of banks is their efficiency enhancing role as delegated monitors. Banks fulfil the role of monitoring projects more efficiently than individual investors. The underlying reason for this characteristic is the banks' asset diversification, which requires a minimal scale. A separating equilibrium in the deposit market would mean that depositors would have to make costs to monitor banks and distinguish good banks from bad banks. By depositing money in banks, they would only exchange the problem of monitoring a project for the equivalent problem of monitoring a bank. It is highly questionable whether this would render an efficiency gain for depositors. Therefore, if banks want to develop in the long run as delegated monitors, a separating equilibrium in the deposit market is unsustainable. The persistence of separating deposit equilibriums would make banks to some extent superficial from the point of view of depositors. This also provides a partial explanation for the presence of some form of depositor protection in all developed financial markets.

In the short run however a separating equilibrium can exist due to special circumstances. This could have been the case in Russia. In section 1 of this chapter we showed that prudential regulation and control was weak or absent. Deposit insurance did not exist. Many banks lacked the scale that is required for diversification and cannot function as efficient intermediaries. Their growth is hampered by the reluctance of depositors. Popular distrust in banks was widespread due to a series of financial scandals and frauds that shocked depositors' confidence in the promises of commercial banks. Both tendencies support the idea of reluctant depositors. Therefore one might suspect that in the case of Russia there could be a problem of deposit rationing, which would imply that banks are seriously hampered in their role of delegated monitors. Add to this the fact that depositors dispose of two certainty equivalents to store value, namely savings in Sberbank (state-guaranteed ruble deposits) and cash holdings of foreign currency. In

this section we already documented the dominant position of Sberbank in the deposit market and analysed the process of dollarisation of the Russian economy. Both certainty equivalents protect savers against inflation (when compared to ruble cash holdings) and against failure of commercial banks (when compared to ruble deposits with commercial banks).

Therefore we think that the Russian situation anno 1994 looks as follows: No rational Russian depositor is prepared to exchange its certainty equivalent of a Sberbank deposit for the risky prospect of a ruble deposit with a commercial bank unless the offered interest rate is higher than the Sberbank benchmark. Hence the deposit interest rate set by Sberbank is a natural lower boundary for ruble deposits with commercial banks. Banks that offer lower deposit interest rates will attract less deposits. On the other hand banks set interest rates as low as their reputation allows, with the lower boundary of the Sberbank rate for ruble deposits. Banks with a bad reputation will have to pay higher interest rates to attract deposits at all. Higher deposit rates can be rightly interpreted as a signal of bad debtor reputation of the bank. This delivers an equilibrium with deposit rationing with one optimal deposit interest rate, which is situated somewhere above the Sberbank benchmark.

To find out whether these inferences make any sense we have to validate two hypotheses :
1) Deposit interest rates have adverse selection properties and can be interpreted as a signal of the riskiness of the bank.
2) The adverse selection effect of deposit interest rates is severe enough to generate an equilibrium of deposit rationing with an optimal deposit rate.

3.4.2. The adverse selection properties of the deposit rate

3.4.2.1. The model

Our hypothesis is that deposit interest rates (id) are a signalling device for the quality of the bank. They measure the reputation of the bank. This allows us to express deposit rates as a function of proxies for the quality of the bank and of some other explanatory variables. This yields the following model :

$$id = C + \alpha_i * (\text{indicator of quality of the bank})_i + \beta_j * (\text{other explanatory variables})_j \qquad (3.1)$$

with id denoting the deposit interest rate, i the number of trust indicators, j the number of other variables and c as a constant.

For the other explanatory variables we have in mind a number of control parameters such as the type of the bank, scale and age. We expect also that regional liquidity differences will explain some of the variation of deposit interest rates. These can be approximated by the loan rate (il). Last we want to put in some structural variables. We expect that current accounts of enterprises will pay lower deposit interest rates, than individual saving accounts.

3.4.2.2. Data, methodology, presentation of results and interpretation

We will perform a cross-sectional analysis with sample A(1994), since that is the only one that gives data on overdue loans. In 3.2.3.2., we found already an indication that our measure of the deposit rate might be distorted by the influence of interbank deposits. Therefore we will exclude interbank activities in this section.

The dependent variable is IDD:
IDD = interest paid / interest bearing liabilities (interbank liabilities excluded)

The independent variables are :
- a constant
    - C
- indicators of the quality and reputation of the bank
    - ER = excess reserves / total assets
    - LIQ = (excess reserves + GKO) / total assets
    - BL = overdue loans / total assets
- control variables
    - LOGSCALE = ln(total assets)
    - LOGAGE = log(age of the bank)
- type of the bank (dummies)
    - MOSCOW
    - STATE
    - NATREG
- regional liquidity differences :
    - IL = interest earned / interest earning assets
- structural variables
    - CADE = share of current accounts in total deposits

We regress IDD on a constant and the type of the bank in equation 1. We add all other independent variables in equation 2. Then we neglect insignificant variables in equations 3 and 4. We expect positive coefficients for BL, MOSCOW (higher competition) and IL. We expect negative coefficients for ER, LIQ, LOGSCALE, LOGAGE, STATE, NATREG and CADE. Results are reported in table III.15.

We see that the type of the bank is insignificant, with the exception of state banks in all equations. State banks pay lower interest rates, which in fact may also be a signalling effect of former state banks being perceived to be safer than other banks. Introduction of the other variables reveals that the control variables are insignificant (equation 2). The coefficients for BL and ER are significant and show the expected sign (equation 3 and 4). Current accounts apparently pay much lower interest rates than individual saving deposits (equations 2, 3 and 4). Regional differences also play a role that comes at the brink of significance. Controlling for regional differences, structural differences and the influence of state guarantees, the significance of BL and ER shows that deposit rates are indeed to some extent a signal of the reputation of the bank concerned.

Table III.15. The deposit interest rate as a signalling device

Independent variable = IDD				
No.	1	2	3	4
C	0.44 ***	0.466	0.586 ***	0.674 ***
	(10.325; 0.000)	(1.36; 0.17)	(7.278; 0.000)	(10.379; 0.000)
ER		-0.84	-1.14 **	-0.837 *
		(-1.162; 0.248)	(-2.228; 0.028)	(-1.737; 0.085)
LIQ		-0.123		
		(-0.22; 0.826)		
BL		0.898 *	0.801 *	1.107 **
		(1.954; 0.053)	(1.747; 0.083)	(2.133; 0.035
LOGSCALE		0.007		
		(0.161; 0.873)		
LOGAGE		0.002		
		(0.027; 0.979)		
MOSCOW	-0.032	0.078		
	(-0.528; 0.6)	(1.046; 0.3)		
STATE	-0.123 ***	-0.105 **	-0.109 ***	-0.099 ***
	(-2.755; 0.007)	(-2.434; 0.017)	(-2.875; 0.005)	(-2.623; 0.0098)
NATREG	-0.039 *	-0.022		
	(0.855; 0.395)	(0.432; 0.666)		
IL		-0.184 *	0.142	
		(1.753; 0.082)	(1.654; 0.101)	
CADE		-0.375 ***	-0.36 ***	-0.418 ***
		(-3.671; 0.000)	(-3.721; 0.000)	(-4.361; 0.000)
Adjusted R²	0.043	0.221	0.239	0.226
F-Statistic	1.82	4.537	8.884	10.102

White heteroskedasticity-consistent standard errors & covariance
For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.
T-statistics and t-probability are in brackets.

3.4.3. Deposit rationing

3.4.3.1. The model

We showed in the previous subsection that deposit rates to some extent function as a signalling device of the quality of the bank and the quality of its loan portfolio. We try to determine in this section how these adverse selection properties affect ruble deposits. The starting point for this analysis is that ruble depositors only observe the ruble deposit rate. We hypothesize that ruble depositors interpret the ruble deposit rate as a signal of the health of the bank. This implies that ruble deposit interest rates (idr) would have adverse selection properties. If a depositor would simply look for the highest deposit rates, he would probably select the worst banks. On the other hand it is evident that, in the case of no adverse selection effects, depositors would invest their deposits in the banks that offer the highest deposit rates. The combination of these two opposite tendencies could lead to an equilibrium of deposit rationing. If this is the case, there exists an optimal deposit interest rate idr* that maximises the expected return for the depositor. If depositors are rational, offering that interest rate would maximise the deposit base for the bank. Deposit rates below idr* urge depositors to shift deposits to banks that offer higher

interest rates. Below idr* the positive income effect of higher interest rates dominates the adverse selection effect. Banks that offer deposit rates above idr* signal their type and will be punished by lower deposit inlays. In this way depositors are rationing their supply of deposits. At the equilibrium deposit rate idr* demand of deposits by banks is higher than supply by depositors. However depositors only supply deposits to the banks with a good reputation. The reputation of banks is signalled by the interest rates they are prepared to pay, as shown in the previous section.

Name the share of ruble deposits in liabilities 'RD'. Then we can express RD:

$$RD = \delta \ idr^{\beta} \ e^{-\alpha idr} \qquad \text{(with } \delta < 1, \ idr_{max}^{\beta} \leq 1) \qquad (3.2.)$$

where idr^{β} expresses the positive effect on RD of higher interest rates in the case of no adverse selection, $e^{-\alpha idr}$ measures the effect of adverse selection on RD and δ is a constant.

Assume that banks optimise RD. We find the optimal idr* by taking first order conditions of (3.2.):

$$\partial RD/\partial idr \qquad = \delta \ \beta \ idr^{\beta-1} \ e^{-\alpha idr} - \alpha \ \delta \ idr^{\beta} \ e^{-\alpha idr}$$

$$= \delta \ idr^{\beta-1} \ e^{-\alpha idr} \ (\beta - \alpha \ idr) = 0$$

which yields
$$idr^* = \beta/\alpha \qquad (3.3.)$$

3.4.3.2. Data, methodology and presentation of results

We perform an OLS on the cross-sectional sample A(1994) with
as dependent variable :
RD   = ruble deposits/total assets,
and as independent variables :
IDR   = interest cost on ruble deposits/ruble deposits.
C   = constant

For the estimation we took the natural logarithm of (3.2.) and then performed OLS.
Concretely the estimated function was : $\ln (RD) = \ln (\delta) + \beta \ln (IDR) - \alpha \ IDR + \hat{e}$

Results are presented in table III.16. Both α and β show the expected sign and are significant. Adverse selection is at work and produces an equilibrium with deposit rationing, with an optimal idr* of about 19.8% according to (3.3.). Our deposit rate variable is off course distorted by inflation. A rough calculation shows that the real deposit rate will be 76.4% higher[26], yielding an idr* of 35 %. Banks that want to acquire a higher deposit base can only do so by raising their deposit rate if their initial deposit rate is below 35%. If they surpass the optimum their deposit base will actually decrease. However, interest rates below 35% affect the deposit base more severely than interest rates above 35%. Above 35% banks cannot increase their deposit base by raising deposit interest rates, but only by getting a better reputation which will lead to lower deposit rates.

Table III.16. Deposit rationing on Russia's deposit markets empirically tested

	Coefficient	Std. Error	t-Statistic	Prob.
δ	0.721424	0.133305	5.411832	0.0032
β	0.305849	0.112807	2.711260	0.0675
α	1.546892	0.150248	10.29562	0.0000
Adjusted R^2	0.577165			
F-statistic	86.31173			

White heteroskedasticity-consistent standard errors & covariance

We plotted the estimated relation in figure III.1. Its distribution is clearly skewed. A bank that decreases its idr 5% below idr* will feel stronger adverse effects on its deposit base than a bank that increases its deposit base with 5% above idr. Banks will most likely deviate from idr* upward and not so much downward. This is verified by table III.17.

Figure III.1. Deposit rationing visualised
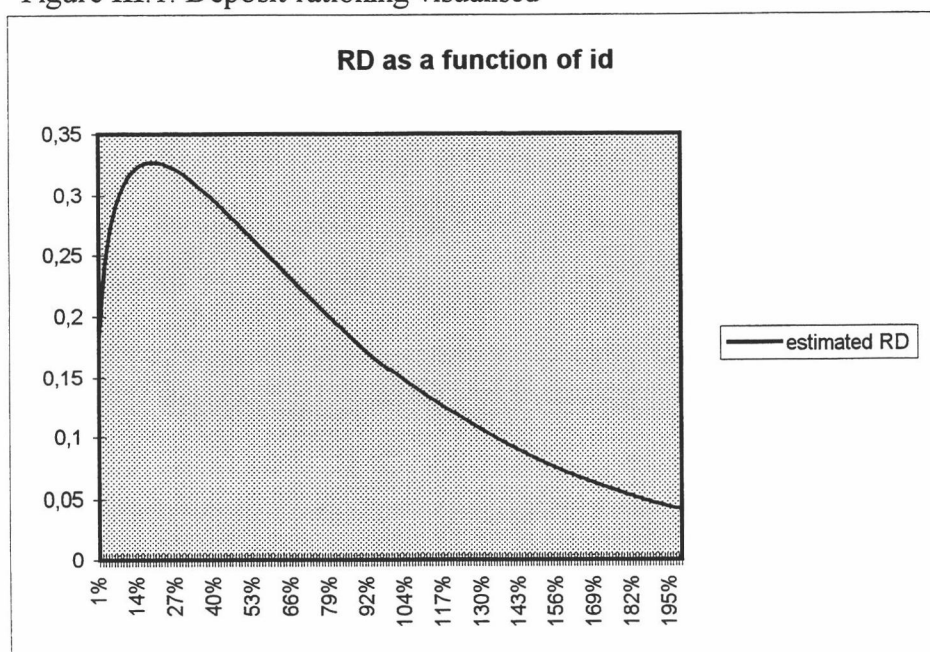
In table III.17., we show the sample distribution of IDR. Group 5 can be called the group that matches idr*. Groups 1 to 4 (with downward suboptimal idr) contain 20 banks, while groups 6 to 22 (with upward suboptimal idr) contain 94 banks. Most banks pay deposit rates above the optimal rate. This is consistent with the estimation in the sense that upward deviations are expected to be more frequent than downward deviations. The underlying reason for this result is the lower boundary provided by Sberbank. We showed above that these larger deposit rates are to a large extent due to the reputation of the bank. On the other hand it is possible that some intrinsically healthy banks try to increase their deposit bases by offering higher deposit rates and end up with lower deposit bases, because they misunderstand the signalling effect of higher deposit rates.

Table III.17. Frequency distribution of IDR

group number	group definition	group frequency	accumulated frequency
1	<2,5%	2	2
2	2,5%-7,5%	3	5
3	7,5%-12,5%	6	11
4	12,5%-17,5%	9	20
5	17,5%-22,5%	12	32
6	22,5%-27,5%	19	51
7	27,5%-32,5%	11	62
8	32,5%-37,5%	9	71
9	37,5%-42,5%	12	83
10	42,5%-47,5%	9	92
11	47,5%-52,5%	8	100
12	52,5%-57,5%	2	102
13	57,5%-62,5%	3	105
14	62,5%-67,5%	5	110
15	67,5%-72,5%	4	114
16	72,5%-77.5%	1	115
17	77,5%-82,5%	1	116
18	82,5%-87,5%	0	116
19	87,5%-92,5%	4	120
20	92,5%-97,5%	1	121
21	97,5%-102,5%	1	122
22	> 102,5%	4	126

IDR is reported without inflation correction. Observed IDR are amazingly low. Correcting them for inflation changes the picture, but still the rates remain low [26]. This is to some extent due to the very low interest rates on current accounts of enterprises, as indicated above. It also indicates that banks collected a lot of inflation tax through the settlement of payments, since this is the main rationale for enterprises to hold current accounts at banks. This link between profitability and inflation tax on current accounts is established explicitly in chapter VI.

4. Centralised credit resources and the problem of directed credits

4.1. Definition

In terms of Russian bank accounting CBR-credits to commercial banks are called 'centralised credit resources', abbreviated as CCR (Androsov, 1995). In 1992-1994 the CBR continued to finance (former) state enterprises to some extent directly and to a much larger extent indirectly through CCR to commercial banks[27]. Therefore, when we analyse CCR, we should keep in mind that these credits are not to be seen mainly as refinance credits to the commercial banks in the form of credit auctions, overdrafts, lombard credits and the alike. On the contrary, a large share of the credits of the CBR to commercial banks (CCR) were so-called 'directed credits' (DC) or 'targeted credits'. These DC were an important subcategory of CCR in early transition. By means of these DC the CBR continued on a large scale to distribute soft credits throughout the economy, mostly using former state banks as agents. For example at the end of 1992 the CBR had issued CCR to commercial banks for a sum of 2616.5 billion rubles, of which about 75 % consisted of DC[28]. The total amount of loans granted by commercial banks to enterprises amounted to 5081.4 billion rubles[29], which means that DC constituted about 39% of all credits granted to enterprises by commercial banks. Unfortunately the notion of DC disappears from CBR reports after 1992, presumably because DC were not complying with the standards required by the IMF as a precondition for stand-by credits. Only data on CCR are available, and it is impossible to discover how the weight of DC in CCR developed.

4.2. Centralised credit resources

We may not know the proportion of DC in CCR, but we do have information about CCR in general. Commercial banks paid a refinance rate fixed by the CBR. However the discretionary power of the CBR was limited by the joint declaration of the government and the CBR about economic policy in 1994. According to that declaration the CBR had to fix the refinance rate at a level not lower than 5 % below the level of the interbank interest rate, as determined by the methodology of the IMF[30]. It was however the CBR who decided who should receive the refinance credits. Only in February 1994 the CBR started with competitive credit auctions. These auctioned refinance credits had a maturity of 3 months. At the start of the auction the minimal interest was fixed at the level of the refinance rate of the CBR. On 27 July 1995 the CBR experimented with an auction without a minimal interest rate, but as a result the interest rate was 90%, which was 65% below the refinance rate. Therefore the experiment was dropped[31]. From 28 September 1995 on the credits had a maturity of two months in stead of three. If refinance credits were not repaid in due time, a penalty rate of twice the refinance rate was required. In July 1994 the penalty rate was softened to 130 % of the refinance rate. The proportion of auctioned credits in total CCR was about 10% in 1997[32]. In practice we observe that the interest rates of the credit auctions were very close to the interbank interest rates for credits with the same maturity, the experiment of July 1994 excluded. In 1995 the CBR lost its discretionary power to distribute CCR to its own priorities. From January 1995 on CCR were distributed among banks through competitive credit auctions[33]. From that date on CCR are in effect purely refinance credits of the CBR to commercial banks and the influence of DC becomes marginal. We note also that a Lombard facility was launched by the CBR only in March 1996[34]. In our period of study a Lombard facility did not exist and credit auctions were of marginal importance, which only leaves us with uncertainty about the scale of DC in CCR.

4.3. Analysing directed credits in detail

DC were issued by the CBR to (former) state enterprises through commercial banks, mostly former state banks with a substantial regional coverage. For enterprises this amounted to indirect monetary financing by the CBR. Therefore DC were without any doubt inflationary. The role of the banks as an intermediary in this scheme was passive with respect to screening and monitoring of the borrower or its project: It was the CBR or the government (independence of the CBR was but a dream in early transition) who decided who should receive which sum. The bank had to transfer the money to the receiver and gained as a rule an interest spread of 3% for the job[35]. During our period of study the practice of DC did certainly not promote the development of monitoring skills at the heart of these former state banks, but rather reinforced the former state banks' passive attitude with respect to monitoring and screening. The DC faded out but still continued certainly until 1994. The new CBR legislation of 1995 made it impossible for the CBR to grant DC (Edwards, 1995). Indeed this practice of indirect monetary financing of enterprises through commercial banks was fully ended in 1995 under the CBR-presidency of Ms Paramonova[36]. This is consistent with Laurila (1996), who claims that the last DC were made available by the CBR in the first quarter of 1995.

DC are a specific Russian phenomenon. They had at least some **adverse effects**. First, soft budget constraints for **state enterprises** were prolonged during transition. Credits were allocated according to a priority list that had nothing to do with the efficient allocation of capital. This retarded the badly needed restructuring of state enterprises and prohibited the growth of new enterprises. Proof of this can be found in the interest rate differential between credits to state enterprise and credits to private enterprises (see chapter V, table V.14).

Instead of granting credits directly, the soft credits to enterprises were masked by rooting them through the banking system. This had adverse effects for the **banks** concerned. As mentioned before the development of **screening and monitoring skills** was at least postponed. Banks are in effect discouraged to monitor, since they have to transfer the DC to predestinated borrowers and are in practice not responsible for failure. Also DC amounted to a form of **subsidy to large former state banks**. Every ruble of DC allowed the intermediating bank to earn a 3% margin, plus the inflation tax on DC in the time lag between receiving the DC and granting the credit. More importantly it was not clear what should happen if the borrower would fail to settle his debt. Should the commercial bank or rather the CBR carry the burden? Numerous interviews with bank directors made clear that in the case of failure to settle, the commercial bank would not be forced to pay back the loan. So while in theory DC had to be redeemed by the enterprises to banks and by the banks to the CBR (they are credits), in practice nothing happened in the case of failure to do so. It is straightforward to see that some intermediary banks that understood this softness of the CBR, could deviate some of the DC to their own pocket by means of **fraud.** Since banks are not responsible for failure, there exists a strong incentive to cheat by granting the loan to a fictive enterprise and then claiming the failure of the enterprise and keeping the money. Suchlike practices are facilitated by collusion between banks, enterprises and corrupt insiders at the CBR. Cooperation of CBR insiders makes it easier to grant DC to non-existing enterprises. The opposite is also true. A strong and honest CBR would make this type of fraud more troublesome. Unfortunately there are indications that such fraud was committed in 1992[37].

4.4. Some indications by the data

Data from RET show that the credits from the CBR to the commercial banks were huge : In table III.18., we divided the stock of centralised credits by nominal quarterly GDP. The numbers indicate that CBR-credit peaked in late 1992 and then decreased with a shock in the first half of 1993 (from 31% to 17.1%) and then more steadily to an acceptable level by end 1994.

Table III.18. Centralised credit resources as a % of Russian GDP

Date	CCR as % of quarterly GDP
Q1 1992	15.6%
Q2 1992	20.8%
Q3 1992	25.6%
Q4 1992	31.0%
Q1 1993	23.2%
Q2 1993	17.1%
Q3 1993	17.8%
Q4 1993	12.5%
Q1 1994	10.3%
Q2 1994	9.8%
Q3 1994	10.2%
Q4 1994	6.9%
Source : Own calculations based on RET-data	

The table shows that the flow of CCR was huge. In 1992, 75% of CCR consisted of DC. For 1992 and 1993 there are no reliable data. The only available estimates of Halligan, Teplukhin and Willer (1996) in RET are contradictory. Their estimates of DC are higher than data on CCR which is impossible by definition.

Table III.19. The importance of centralised credit resources to commercial banks

	Centralised credit resources divided by				
Date	Interbank Credits	Interbank Credits	Individual deposits with commercial banks	Other deposits with commercial banks	Credits of commercial banks to economy
	Russia (1)	Moscow (2)	(3)	(4)	(5)
1/01/93	88.4%	na	47.529	7941	51.6%
1/04/93	86.1%	na	35.319	6.448	46.0%
1/07/93	86.1%	na	21.839	5.128	33.7%
1/10/93	86.6%	na	14.089	5.183	42.1%
1/01/94	71.8%	0.111	6.021	3.615	35.2%
1/04/94	62.1%	0.067	2.740	3.138	31.9%
1/07/94	59.5%	0.042	1.631	2.930	26.0%
1/10/94	55.3%	0.018	1.557	3.179	23.5%
1/01/95	39.2%	na	0.876	2.080	14.6%
1/04/95	33.5%	0.014	0.633	1.515	11.4%
1/07/95	27.5%	0	0.437	1.201	10.8%

Source : Own calculation based on CBR, Bulletin of Bank Statistics and Tekushie Tendentsii v Denezhno-Kreditnoi Sfere, various issues

We are mainly interested in the impact of CCR and DC on the commercial banks. Unfortunately there are no reliable sectoral bank data for 1992. Therefore we concentrate in table III.19. on data for 1993 and 1994. We can safely claim that conclusions for 1992 would have been even more severe.

Table III.19 allows to make a number of observations. In column (1) we show the share of CCR in total interbank credits[38]. The share of CCR steadily diminishes with two noted jumps in January 1994 and in January 1995. It is not clear to which extent (1) is influenced by the development of the interbank market. Therefore we related CCR to other relevant variables in columns (3), (4) and (5). Column (2) shows the share of CCR in interbank credits for the city of Moscow. The difference with the average Russian level in (1) is striking and suggests two points : The interbank market is much more developed in Moscow than in the rest of the country and CCR are not uniformly distributed across regions (see table III.20.).

Column (3) and (4) relate the CCR received by commercial banks to the deposits collected by them. In early 1994 deposits were not essential as a source of finance, when compared to CCR. This dominance of CCR has steadily crumbled over time. It is interesting to see how individual deposits evolve from completely unimportant (47.529 on 1/01/93) into more important than CCR (0.437 on 1/07/95). The most important inference follows from column (5). Column (5) shows that in early 1993 more than 50% of commercial banks' credits to the economy were financed by CCR. By end 1994 this had decreased to about 15% and by mid 1995 to about 11%. These data are consistent with Koen and Marrese (1995), who give data for the share of DC in total bank credit. They put forward that DC were about 48% of total bank credit in 1994, down to about 29% in 1993 and 23% in 1994. The numbers indicate the huge influence of CCR and DC on the flow of funds throughout the economy. Add to this that interbank credits, another important source of finance, are to a large extent net credits from Sberbank to commercial banks (see section 4) and it becomes clear that at least initially commercial banks were to a large extent semi-market intermediaries between central resources and enterprise credits. The exception to this rule may be Moscow, where the new financial wealth of Russia was accumulated.

In order to understand better this initial role of commercial banks as intermediary between central resources and enterprises, we investigate the regional differences in the distribution of CCR. This is done in table III.20., where we report CCR (part of account 822) divided by the required reserves of the commercial banks at the central bank (account 15). As will be explained in chapter V, required reserves are a function of ruble deposits. Therefore the data in this table are a good indicator of regional CCR-dependence.

First, we observe that the Far East Region, the East-Siberian Region, the Northern Region, the Central Black Earth Region are in this order the most CCR-dependent regions. These regions are clearly the regions were the economic crisis has hit harder than in the rest of Russia. This creates suspicion about the true nature of CCR. If CCR are going to the weakest developing regions they are presumably rather soft subsidies than efficient allocations of bank refinance. The second observation is that the standard deviation across regions decreases substantially during 1994 from 2.68 to 1.14. This indicates that the discretionary reallocation of resources across regions by the CBR lost momentum during 1994. The data series is discontinued in 1995, but we can safely assume that the standard deviation has further decreased, since the CBR

started distributing CCR by means of competitive credit auctions in early 1995, as mentioned before.

Table III.20. Centralised credit resources compared to required reserves

Name of the region \ Date	1/01/94	1/07/94	1/10/94	1/12/94
Northern Region	5.8	3.2	2.1	1.9
North-Western Region	0.6	0.5	0.4	0.4
Central Region	1.0	0.7	0.6	0.6
of which Moscow	0.3	0.1	0	0
Volgo-Vyatskiy	4.7	3.9	3.2	3.0
Central Black Earth Region	5.1	4.3	3.5	3.3
Povolzhkiy Region	3.7	3.2	2.7	2.6
North-Caucasian Region	4.1	2.9	2.3	2.2
Ural Region	2.9	2.4	2.3	2.1
West-Siberian Region	4.1	2.7	2.4	2.4
East-Siberian region	8.0	5.3	3.6	3.4
Far East Region	9.5	5.7	4.3	4.3
Pribaltic Region	1.4	1.4	1.3	1.4
Other	5.7	0.7	0.2	0.1
Russia total	3.2	2.1	1.6	1.6
Standard deviation[39]	2.6820814	1.643629	1.188933	1140972

Source : CBR, Tekushie Tendentsii v Denezhno-Kreditnoi Sfere, various issues

One can question whether this discretionary reallocation by the CBR might have influenced regional interest rate differentials. Unfortunately empirical investigation of this relation is impossible due to the lack of data. Our sample A is not detailed enough to say anything about CCR and DC. The problem is mainly in the legacy of the Soviet accounting system. There exists one subaccount in the Russian accounting system that captures CCR, namely account no. 824 (Androsov, 1995). It is however not possible to distinguish DC within the CCR.

Notes of chapter III

1. "On the Central Bank of the Russian Federation (Bank of Russia)", law of the Russian Federation, No. 394-1, 2 December 1990

2. See article No. 2 of the Instruction of the CBR, No. 1, 30 April, 1991

3. CBR, Tekushie Tendentsii v Denezhno-Kreditnoi sfere, No. 3(25), p. 34

4. Banks had to start operations within 1 year after their registration and licensing.

5. We applied an exchange rate of 4317 rubles for one dollar, based on MICEX-data from Russian Economic Trends.

6. In most market economies minimal capital requirements amount to several millions ECU.

7. Instruction of the CBR, No. 1, 30 April, 1991.

8. National or regional banks have by definition connections with more enterprises in different regions, have a branch network in at least three regions and are by nature better diversified, all of which must facilitate trust of investors in their stability and hence positively affects their ability to raise additional equity.

9. The CBR has understood this risk. In 1995-1997 the CBR has been more and more active in enforcing capital requirements and capital adequacy on the banks. Also the risk was controlled by the policy of required reservation on deposits, that was quite strictly enforced by end 1994. See chapter IV for more details.

10. The law of Gresham applied originally to the bimetallic standard. Shifts in relative prices of silver and gold caused shifts in the relation between the intrinsic values of the coins made out of these metals. The coins with lower intrinsic value drove out of circulation coins with higher intrinsic value, which is tantamount to saying that coins with the highest intrinsic value drove out coins with lower intrinsic value as stores of value.

11. Aggregate capital flight was calculated as the sum of Tikhomirov's estimates for 1992-1994, added the medium estimate for 1991 in the literature (8.2 tn).

12. The exchange rate applied was 2287.75 rubles/US dollar, which was the average exchange rate in 1994, measured as the average of the 12 end of month exchange rates of the dollar at MICEX.

13. Data on investment and banks' credits to the economy are from the CBR.

14. The MICEX R/US$ rate went from 144 at end April to 113 at begin June.

15. CBR, Bulletin of Bank Statistics, 1995.

16. RET, 1996, Vol. 5, No. 3, p. 114.

17. When I subscribed to the Bulletin of Bank Statistics, an official CBR publication, at the offices of one of the official distributors of the CBR, I paid in dollars and got a receipt in rubles. The exchange rate applied was slightly in my favour. If even official bodies that are so close to the CBR neglect the law that forbids the use of dollars as transaction money, it certainly raises suspicion about the actual currency denomination of the average business deal.

18. The table is based on monthly data. For each quarter we calculated the average of the three monthly data points of the quarter concerned. For Q4/95 we took the average of October and November 1995, because December was not available.

19. Brazil before the Real-plan we mean here.

20. A number of pyramid schemes collapsed and affected the credibility of all commercial banks that promised high interest rates. Pyramid schemes are investment funds or banks that promise high returns and pay out these returns from new contributors to the fund. As long as the inlays of the population grow fast enough the pyramid can keep up appearances, but when the growth of the pyramid is curbed the system inevitably collapses. The most notorious Russian pyramid scheme was the MMM-fund led by the charismatic Peter Mavroidis. Later, he participated in the duma elections and was in fact elected, which enabled him to escape prosecution. Note that in late 1996 the same happened in Albania, but on a much larger scale. The resulting popular revolt in 1997 was so explosive that it threatened the very existence of Albania as an independent country.

21. CBR, Bulletin of Bank Statistics, No. 1, p. 15, table 7

22. Decree of the President of the Russian Federation, No. 1998, 14 October 1994

23. Decree of the President of the Russian Federation, No. 2001, 18 October 1994

24. End 1994 Sberbank had more than 34,400 branches across Russia, which is about 7 times more than all other banks together at that time (CBR, Bulletin of Bank Statistics, 1995 various issues and Sberbank, Information Bulletin, 1995, various issues). In 1994 Sberbank hired 24,585 new employees, which was below the number planned in the business plan (Sberbank, Information Bulletin, 1995, No. 1(4), p. 17-18).

25. These bailouts have realised at many occasions and in many different countries. Recent examples are the US, Norway, France, Japan and Spain.

26. Interest rates and the spread were calculated by dividing a flow variable (interest income) by the end of period stock variable (Xe). Because of inflation (π) and real growth the calculated rates are an underestimation. We provide a simple correction for inflation distortions. The stock variable that should have been used is the average stock over the period. Using monthly inflation numbers from Granville (1995) we calculated for every month the nominal value that corresponds with the end of period stock value, assuming real growth at zero. This yields 13 monthly data that are constant in real terms. We multiply these 13 and take the 13th root, which delivers the average of the stock value (Xa). The correction factor is then c = Xa/Xe. Since Xa was determined as Xe*f(π) we see that c = f(π). Hence c can be calculated with the use of inflation data only. We found a c of 1.764 for Russia in 1994, which means that interest

rates are about 76% higher than indicated by the data, if correcting for the data alone.

27. The CBR also financed enterprises indirectly through credits to the former republics (now CIS countries). Most of these credits served for paying the export of Russian goods to the republics concerned. This situation is analysed in detail in chapter IV.

28. Based on CBR-data, CBR, Annual Report, 1992.

29. Based on CBR-data from the Bulletin of Banks Statistics, No. 1, table 4.

30. CBR, Tekushie Tendentsii v Denezhno-Kreditnoi Sfere, No. 3(25), p. 32.

31. CBR, Tekushie Tendentsii v Denezhno-Kreditnoi Sfere, No. 12, p. 18-19.

32. CBR, Tekushie Tendentsii v Denezhno-Kreditnoi Sfere, No. 3(25), p. 34.

33. "In compliance with the joint declaration of the government and the CBR 'About the Economic policy in 1995' the CBR changed the mechanism for the supply of centralised credits, and from the start of 1995 the refinancing of banks was exclusively accomplished through market methods, by means of credit auctions" (CBR, 1995, Tekushie Tendentsii v Denezhnoi Kreditnoi Sfere, No. 8(30), Moscow, p. 48).

34. RET, 1996, Vol 5, No. 2, p. 25.

35. As explained to me by officials from Promstroibank and Mosbusinessbank.

36. As explained to me by Ms Paramonova at the occasion of her visit to Bruges, Belgium, 1996.

37. "The Moscow City Court started on Wednesday (the 10th of January) with the hearings in the case of corruption in the CBR. The following former responsible officers of the operational department of the CBR are accused of having accepted bribes : Head of Department Ravil Sutdikov and his deputies Raisa Turova, Valentina Popruga en Vladimir Martinov. According to experts these persons in 1992 granted privileged credits for a total of 5 billion rubles to a number of banks and commercial enterprises, this to their own benefit. Interfax says that the loss for the state resulting from their illegal acts constituted 554 million rubles in prices of 1992." (Izvestia, 11th of January 1996, p. 1).

38. The Russian accounting system notes both in account 822, but the CBR publications provide split data.

39. The standard deviation was calculated with the exclusion of the category 'other' to avoid distortions. Inclusion of the category 'other' would only make the conclusion of diminishing standard deviations stronger.

Chapter IV. The payment system

0. Overview

In this chapter we concentrate on the role of commercial banks in payments. Several conclusions can be drawn from the analysis :

- The domestic payment system in early transition was inefficient and slow.
- There are indications that payment inefficiencies contributed to the growth of interenterprise arrears.
- On the other hand, the payment system also suffered from the 1992 netting operation of interenterprise arrears.
- The CBR plays a centrally important role in payment settlement.
- Large banks are likely to be large payment settlers.
- The payment system for intra-CIS payments (or interrepublican payments) collapsed.
- This payment system failure was costly to all CIS-countries, but least of all to Russia.
- The proposed payments union never was operational due to political considerations and the dominance of the Russian partner in the system.
- As a reaction to payment inefficiencies, non-financial enterprises entered the business of settling payments.

We also find indications that banks may have been slowing down payments in order to create payment float and earn inflation tax income. However the link between payments and bank profitability is established empirically only in chapter VI.

1. Introduction

There exists little theoretical literature on the role of banks as payment settlers. Primitive economies settle value transfers between agents by means of barter or by means of cash. Economic intuition and economic history indicate that payment settlement by means of deposit money is important in any developed market economy. However, in Russia the high inflation in early transition and a series of bank scandals reduced confidence of the populace in commercial banks and in deposit money in general (see chapter III). Therefore the payment system was largely based on barter and cash payments, often in foreign currencies such as the US dollar or the German Mark. These forms of payment settlement are relatively inefficient. The building of an efficient payment settlement system by means of deposit money would enhance the transition to an efficient market economy because it minimises an important transaction cost with a potential for distortion.

In principle payments could be settled without private banks, through a centralised system where all payers hold a payment account. Examples of such centralised systems could be the central bank or a private clearinghouse. In practice we observe that in market economies payment settlement is based on a network of mutual bank accounts, with the central bank and private clearing houses often playing a coordinating role. Banks, if they are in place, are as a rule involved in payment settlement. The microeconomic rationale behind this stylised fact is that banks have strong incentives to engage in settlement. Transferring deposit money from account to account, without the physical transfer of resources is by far the safest way to settle

payments. Banks perform this transfer more efficiently than competitors because they benefit from synergies between their role as payment settlers and their other roles. First, banks provide deposit accounts to savers. They can boost the productivity of their network of deposit accounts by offering the additional service of payment settlement. The additional service makes their product (deposit accounts) more attractive to customers and will boost revenue at the cost of limited investments (provided that payment services are not cross-subsidised). Second, settling payments reveals important information about the financial situation of payer and payee. If banks can get free access to this type of information, they have an informational advantage which allows them to allocate credits more efficiently than competitors, for the additional information facilitates banks screening and monitoring. Banks are Pareto-superior to markets exclusively in the presence of market imperfections, the most important of which is asymmetric information. Information is distinctively asymmetric in Russia. Therefore the additional information from payment settlement is crucial to Russian banks. Also a well-functioning payment system is crucial to the success of transition in general. For these reasons it is of the utmost importance to analyse the Russian payment system.

An important issue in payment settlement is the involvement of both the private sector (commercial banks, private clearing houses and interbank money market) and the public sector (the CBR). With respect to Russia, it is clear that the CBR has a major role to play. The CBR is the only institution which has a countrywide network of offices and processing facilities readily available and where all commercial banks hold reserve accounts. It is the only player in the market of payment settlement that can tie the economy together. Moreover the central bank is responsible for the stability of the financial system. One of the highways along which systemic risk spreads throughout a banking system is the payment system. The CBR must sufficiently contain these payment system risks. It can do this by supervising clearing houses and by enforcing certain rules upon commercial banks. An active role of the CBR in payment settlement may also function as an early warning system for financial stress of commercial banks. On the other hand there must be sufficient competition in the sector in order to avoid the negative consequences of a legal monopoly of the CBR. The CBR should allow the commercial banks to play a role in payment settlement. This is important for the efficiency of the system and for the development of the commercial banks.

In this section we will analyse how the payment system by means of deposit money developed in Russia and how it influenced certain aspects of the transition. The main aspects under scrutiny will be the relative roles of the CBR and private initiative, the relationship between the payment system and IED and the role of the payment system failure in the collapse of interrepublican trade.

2. The development of the domestic payment system

2.1. Communist modes of payment[1]

Basically two important modes of payment were used in the Former Soviet Union (FSU), namely payment demand (platyozhnoye trebovaniye) and payment order (platyozhnoye porucheniye).

Payment demand

A payment demand was sent by the seller (payee) to his bank after the shipment of the goods to the purchaser (payer). The supplier's bank forwarded the payment claim to the bank of the purchaser. If the funds were available on the account of the purchaser, his bank would pay the demanded amount on the bank account of the seller within three days. Payers were given in other words three days to oppose the payment demand. If the payer did not oppose, the bank of the payer would automatically pay the requested amount. Afterwards the payer could oppose the effected payment, by means of a refusal-to-pay document. If the payer did not oppose payment, but had insufficient funds on his account on the moment of payment demand, the demand was filed in a special file, the famous *kartoteka-2*. Unpaid payment demands were filed in kartoteka-2 in order of date of arrival and were paid out to the payee when funds arrived on the account, on a first-in-first-out basis. Suppliers enjoyed payment sooner or later, since payment was ultimately guaranteed by the soft budget constraint of the purchaser. The fact that they had to wait, did not really matter, because the time value of money did not exist and budgets were soft. It is clear that payment demand is a technique that fits well communist practice, but is inappropriate in a market environment, where the time value of money and market discipline are of central importance. Until July 1992, 70% of the payments volume was established by payment demand. This most certainly stimulated the crisis of IED in the first half year of 1992. The kartoteka-2 procedure was abolished in July 1992. From then on unpaid payment demands were filed in the requesting enterprises themselves. This made state enterprises aware of their responsibility for the quality of their debtors and introduced more market discipline.

Payment order

This amounts to a simple order to transfer money. After the purchaser received a document from the supplier with details on the goods and price to be paid, he issues an order to pay the supplier. This payment order is transferred to the bank of the purchaser and this bank transfers the ordered amount to the bank account of the supplier. In communist practice, the supplier usually sent the needed documents at the same time as the shipped goods. Therefore a payment order amounted to a payment after delivery, very similar to the payment demand. The certainty of payment was ultimately guaranteed by soft budgets. However, when inflation and market practices were introduced in 1992, suppliers started to send the documents before delivery and required the purchaser would issue a payment order before delivery. So suppliers could ensure payment by not shipping the goods until they had received the payment from the payer. This version of payment order is now widespread in Russia. It is commonly referred to as pre-payment (predoplata).

Off course some other payment techniques exist, such as cash payment, cheques and others. However, payment order is by far the most important mode of payment.

2.2. The communist settlement system

Till end 1987 all payments were routed through the accounts held by enterprises at the various branches of Gosbank (Coopers and Lybrand, 1992). This slow and inefficient system was the single legal way to settle non-cash payments in the SU. Before 1988 enterprises did not care

about payment settlement. Soft budgets prevailed and plan fulfilment was more important than the profitability or the finality of payments. The time value of money was ideologically not recognised and did in fact not exist in communist economic organisation. There was no incentive to settle payments time-efficiently, since payments were merely financial representations of planned real transactions, designed to exercise control over enterprises. This was mirrored in the widespread use of payment demand.

2.3. Perestroika and the MFO-system

The perestroika under Gorbachev changed this classic setting as explained at length in chapter II. The Law on State Enterprises of 1987 increased the freedom and the responsibility of state enterprises. State enterprises gained decision power over their own bank accounts. From 1988 on a lot of state enterprises founded their own house banks for the management of their financial activities. These banks had initially no access to the payment system of Gosbank (later the CBR). Also the former monobank was split into a number of independent commercial banks. As a consequence of these reforms a system of direct payment settlement between bank branches through a network of correspondent accounts (MFO)[2] arose. Gradually more and more payments were routed through this MFO-system. The MFO-system increasingly grew out of control of Gosbank and proved to be slow and ineffective. The reasons are obvious. The system was essentially a chaotic web of correspondent accounts between bank branches, not between banks. This means that also intra-bank payments were routed through the system. Technically there was a lack of telecommunication and automatisation in payment settlement. The system was based on mailing of payment documents between banks and manual processing. Also there was a problem of human resources. Bank employees were neither trained nor experienced in payment settlement and therefore the whole MFO-system developed by trial and error. Regulation of commercial banking was absent[3], and competition was in practice absent, which created room for abuse by the banks. Also the new independence of state enterprises increased the number of payments. This combination of factors created a considerable increase in the amount of float money. Payment delays of several weeks were not unusual.

2.4. The RKT-system of the Central Bank of Russia

The CBR (or Gosbank before December 1990) understood that the payment settlement system was deficient and that it was abused by the new commercial banks. Already on November 23rd, 1990, the former Gosbank issued regulations for the organisation of a network of regional cash settlement centres (or RKT[4]) and computer centres (CC). This RKT-system was intended to replace the MFO-system. Every bank could open correspondent accounts with the RKT and effect payments through these accounts. The RKT-system became fully operational only in October 1991, just before the dissolution of the FSU and the price liberalisation in Russia. It coexisted with the MFO-system until April 1992 when the CBR made the RKT-system compulsory for all interbank payments (Coopers and Lybrand, 1992). It was mainly G. Matiyukhin, the new and inexperienced chairman of the CBR, who insisted on this excessively high degree of centralisation in payment settlement (Åslund, 1993). This obligatory use of the RKT-system led to congestion in several RKT, payment delays and a build-up of arrears (Åslund, 1993) and urged the CBR to withdraw the requirement in May 1992 (Sensenbrenner and Sunderarajan, 1994), which meant the 'reintroduction' of the MFO-settlement system. With respect to intrabank settlement, banks were always free to set up their own system.

Sberbank was the first bank that introduced a system for settlement of intrabank payments between its clients. Some other large banks followed. However, the majority of commercial banks preferred to settle intrabank payments through the RKT-system.

Coopers and Lybrand (1992) and Sensenbrenner and Sunderarajan (1994) describe in detail how the RKT-system functions. The CBR eventually founded about 1600 RKT. There exist local RKT and main or regional RKT, which serve a number of local RKT. Computer centres were founded for groups of RKT. Every bank can open correspondent accounts with a local RKT or a regional RKT or can possibly open a direct telegraphic line with the computer centre of its RKT.

One can distinguish three types of payment. First, there are payments between banks that have telegraphic connections with the same computer centre. Such payments take only 1 or 2 days, if the system works effectively. Second, there are payments between banks without such telegraphic connections with a common computer centre, but served by the same RKT. This means that there is a need for mailing between both banks and the RKT. Such payments can take several days to more than a week, depending among others on the efficiency of the local post office. Last, we describe a payment between banks that hold correspondent accounts at different RKT. In the worst case these RKT also belong to different main RKT. Usually these payments are interregional payments or intercity payments[5]. The bank of the payer transfers payment documents to its local RKT. The local RKT transfers to the main RKT of the region. This main RKT of the region of the payer forwards to the main RKT of the region of the payee. The main RKT of the region of the payee transfers to the local RKT of the payer, which finally transfers to the bank of the payee. All connections between main RKT's involve the communication of documents, by mail or courier services. In the worst case interregional payment settlement through the RKT-system can take several months or simply fail because documents are lost in the complicated flow of documents. Note that this RKT-system generates quite some debit float. The CBR account of the commercial bank that issues a payment order is debited immediately. Then the whole procedure through the RKT-system runs, before at the last moment the receiving bank is credited.

The stress on communication between main RKT for long distance payments is due to security reasons. Fraud with counterfeit payment documents and cheques has emerged on a large scale. The CBR tried to counter fraud inter alia by limiting the number of communication links and securing those links to the highest possible extent. Local RKT were allowed to communicate directly with each other only if security could be guaranteed. Payment settlement also involves accounting and control procedures, which created an additional flow of documents to be canalised through the system. A special regulation exists for payments to Moscow. Any bank can transfer payment documents through his local RKT and main RKT, directly to a Moscow bank, without interference of any Moscow RKT. It is the bank itself that transmits the documents to the concerned RKT and asks for crediting of its account. This special regulation for Moscow was needed in order to speed up payment settlement. Moscow developed into the financial centre of Russia and the standard payment procedures were not adequate to deal with the large volume of payments in Moscow.

Initially banks were allowed to have negative saldi on their correspondent accounts with the RKT, without any clear time limit nor interest obligations. This amounted to zero interest

overdraft credit from the central bank to commercial banks. This feature was possibly rather due to the weak organisation of the RKT-system than to a deliberate policy of the central bank. This free lunch overdraft steadily grew in volume from 0,1% of GDP in May 1992 to a peak of 0,6% of GDP in March-June 1992 (Sensenbrenner and Sunderarajan, 1994). This situation was a strong disincentive to the development of a short money market. This distortion was corrected in two steps. In May 1993 the CBR instructed that as of the first of June the automatic overdraft was limited to five working days[6]. If the debited sum was held longer than five working days, then all funds transferred to the correspondent account concerned were as a priority used to clear the overdraft, without asking permission to the bank. This meant de facto that payments were blocked until the overdraft credit was settled. On 24 November 1993 the last free lunch of five working days was also abolished[7]. No overdraft credit became the new rule. In exceptional cases banks could receive a short term credit under very restrictive conditions. More precisely the overdraft credit was limited to a maximum of seven working days and could not excess 25% of the concerned bank's required reserves at the CBR. The interest charged equalled the interest rate for overdraft credit to commercial banks on their correspondent accounts at the CBR. If the credit was not redeemed, all funds transferred to the correspondent account were in first order used to redeem the credit[8].

2.5. Development of a hybrid system

Interbank payment settlement through direct correspondent accounts was authorised from June 1992 on (the obligation to use the RKT had been abolished by the end of May 1992). Thus from July 1992 on, the Russian payment system has been a combination of the RKT-system and private initiative, with a growing role for the private initiative. The old MFO-system that had been developing before the introduction of the RKT in October 1991 arose again but this time in an environment that was more favourable to its stable development and with a new stress on telecommunication infrastructure and automatisation. Initially the commercial banks were reluctant to contest the RKT-system, partially because of the lack of trust they had in each other. Gradually the commercial banks developed networks of correspondent accounts, which were more and more linked electronically. Some large banks with branches in several regions developed efficient systems for intrabank clearing. These intrabank clearing systems offered smaller banks an alternative for the settlement of interregional payments through the RKT-system. In principle interregional payments can be fully settled through private clearing, provided that there exists an appropriate chain of correspondent accounts. In practice usually only the interregional part of interregional payments is settled through these intrabank systems while the local part is mostly routed through the RKT-system, where all banks have an account. These payments are referred to as W-type payments by Sensenbrenner and Sunderarajan (1994), as illustrated in figure IV.1.

For purely intraregional or local payments the RKT-system plays a centrally important but still diminishing role. Also private clearing houses emerged. On November 16th of 1993 the CBR issued the first four licences to private clearing houses, namely Mosclearingcentre, Financial Group of the Ural, Bank Information Technologies and Interbank Financial House[9]. However, the first private clearing mechanisms became fully operational only in late 1994, under strict regulation and supervision of the CBR. They are mainly used for regional clearing of payments. Note that in November 1993 also the free overdraft credit of the CBR was abolished (see above). This timing seems to be logical. It was impossible for private systems to compete with

the RKT before, since the RKT offered free overdraft credit while private systems charge fees to finance final balances on the money market.

Figure IV.1. W-type payments

Intrabank settlement between
Regional branches of large bank

Bank A

Bank B

Local RKT
of region A

Local RKT
of region B
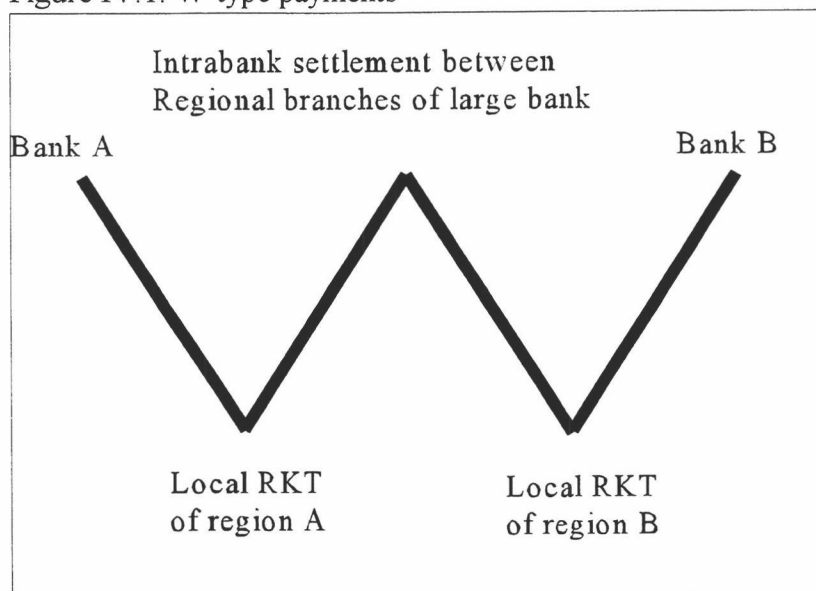
2.6. Evaluation of the hybrid system

This hybrid system proved to be slow and inefficient for several reasons. Russia started in 1992 with an underdeveloped payment system and without a worthy market alternative for the RKT-system, which had some weaknesses. First, the capacity of any production line is determined by the capacity of the bottleneck. Because of the pyramid structure of RKT-payments, lack of capacity or sheer incompetence in only one RKT could slow down the whole chain of payment settlement. Second, the lack of automatisation and telecommunication and the huge flow of documents reduced the efficiency of the system, certainly for interregional payments. This was aggravated by sometimes unclear procedures and regulations. Third, the brain drain of (relatively) experienced staff to the emerging commercial banking sector left the RKT-system with relatively inexperienced staff. This continuous loss of knowledge must have contributed to the delays in payment settlement. Fourth, there were some specific Russian phenomenons that jammed the RKT. Below in this chapter we will show that the clearing of interenterprise debt (IED) and the subsequent flow of documents in the second half of 1992 constituted a serious blow to the efficiency of the system. Sensenbrenner and Sunderarajan (1994) show that the net credit of the CBR to the government slowed down payments through the RKT-system. They found a stable and significant relationship between changes in RKT-float and changes in CBR-credit to the government. The intuition behind this finding is that the irregular waves of credit are transferred to the receivers through the RKT-system and cause capacity problems and bottlenecks. The clearing of IED was so far unique and CBR-credit to the government decreased steadily throughout the period under study, so the influence of these factors is phased out over time. Fifth, the system favoured the former state banks because Sberbank, Rossel-khozbank and Promstroibank did not have to pass the RKT-system. Instead they had direct access to the computer facilities of the CBR. This resulted in strongly reduced settlement delays, a strong competitive advantage in an inflationary environment. Last but not least, the

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RKT-system created a large amount of debit float. This debit float reduced the liquidity of the banking sector and of the whole Russian economy. Moreover the debit float was not only large but also variable, due to unpredictable delays in settlement and to waves of CBR-credit to the economy (Sensenbrenner and Sunderarajan, 1994). This large and variable payment float affects the efficiency of reserve management by commercial banks. Indeed, in chapter V we will show that the unexpected large volume of excess reserves of commercial banks can to a large extent be explained by payment system inefficiencies. This float problem also complicates monetary policy by the CBR because it is difficult to measure the liquidity of the commercial banking sector. Banks that hold large excess reserves may seem liquid, but possibly they just hold these reserves to secure themselves against unpredictable shocks in payment float.

But also commercial banks were to blame for the inefficiency. Many banks did not develop any system for payment settlement, even if only intrabank settlement. Lack of telecommunication infrastructure and automatisation were certainly not only characteristic of the RKT-system. Commercial banks assumed the accounting procedures of the central bank and also created themselves debit float, at the cost of their customers. Transition added to this an adverse incentive problem. Both commercial banks and the CBR could earn easy money by slowing down the settlement process, in that way creating profitable float money. Note that we are dealing here with valuta months instead of valuta days. Float money is valuable because of the time value of money, which was high in Russia because of the high inflation. Both commercial banks and the CBR assumed their share of the inflation tax. However money has a time value without inflation too. Therefore the adverse incentive problem can persist after price stabilisation. The clue to resolve the problem is somewhere else. Banks could exploit the time value of money because bank competition was initially limited and supervision and regulation[10] were inadequate. The RKT and the commercial banks could easily blame each other for the slow settlement. We also point to the continuous reforms in payment settlement regulations and procedures, which stimulated confusion and delays. The commercial banks did not quickly develop private clearing systems, but that was also due to the CBR who till end 1993 supplied free overdraft credit and practically excluded private initiative. Last, the new independence of state enterprises and the multiplication of banks increased the flow of payments enormously. The weak and unstable hybrid system was not equipped to face such a challenge.

3. The relation between the payment system and interenterprise debt in 1992-1994

3.1. Interenterprise debt in Russia

Notwithstanding the fact that the quality of the data is rather poor, all data (see figures IV.2. and IV.3.) confirm that there has been a severe crisis of IED in the first three quarters of 1992. Figure IV.2. suggests that the crisis was solved, during the last quarter of 1992. The solution was the netting mechanism organised by the CBR and the subsequent monetisation of the net IED (see section 3.3.). The mechanism was an unclear and lengthy process and its effect on IED was spread over the second half year of 1992. Figure IV.3. shows that in the first half year the share of overdue IED was skyrocketing, while also IED in months of GDP increased substantially. The dramatic rise of overdue IED in early 1992 seems to indicate that a substantial share of IED was a signal of financial distress. We will analyse in section 3.2. whether the deficient payment system may have played a role in the emergence of IED, and in section 3.3. whether the clearing of IED may have hampered the functioning of the payment system.

Figure IV.2. Interenterprise arrears in Russia

Interenterprise arrears in Russia

Total receivables in months of GDP versus receivables of industry in months of industrial production

—□— Total receivables of economy in months of GDP

—◇— Receivables of industrial enterprises in months of industrial production

Source first item : Own calculations based on data from Goskomstat

Source second item: Q. Fan and M. Schaffer, 1994, ESRC paper n 191, Feb 1994, p. 47

Figure IV.3. Are interenterprise debts overdue ?

Interenterprise debts in Russia

Share of overdue debts in total debt

—□— Overdue IED / Total IED

Source : own estimations using Goskomstat-data
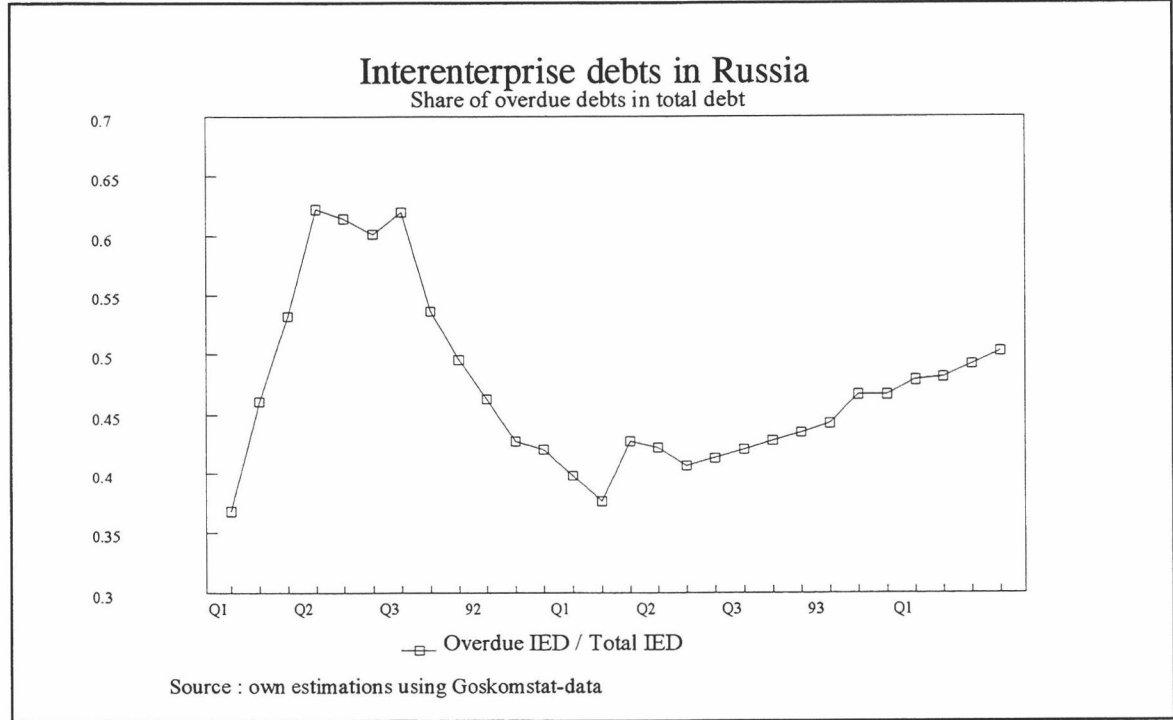
3.2. The role of the payment system in interenterprise debt

3.2.1. The crisis of July 1992

Table IV.1. Unpaid payment demands and interenterprise debts

Date	Unpaid payment demands (Kartoteka-2)		Receivables for goods and services	
	in bn of rubles	in months of interenterprise turnover	in bn of rubles	in months of industrial production
31/12/90	17	0.2	25	0.6
31/12/91	34	0.2	71	0.6
1/02/92	141	0.4	-	-
1/03/92	606	0.9	315	0.5
1/04/92	666	0.8	751	1.0
1/05/92	1855	1.9	1140	1.3
1/06/92	2056	2.0	1885	2.1
1/07/92	3004	2.5	2437	2.4
1/08/92	1876	1.4	2879	2.5
1/09/92	1084	0.8	3110	2.6
1/10/92	440	0.3	2997	2.3
1/11/92	397	0.2	2750	1.5

Above, we described the inappropriate stress on payment demand in early transition. This system used to provide the seller with a de facto soft budget guarantee for payment of the shipped goods. Once a seller (payee) had shipped goods, he sent a payment demand to the bank branch of the purchaser (payer). If the purchaser did not have sufficient funds on his account the payment demand was filed in a special waiting list, the so-called kartoteka-2. The payment demand stayed there, till sufficient funds arrived on the account of the purchaser to pay the producer, on a first-in-first-out basis. This inappropriate use of payment demand contributed to the crisis of IED in the first three quarters of 1992, for the system of payment demand puts the responsibility for the payment with the banking system. After the price and trade liberalisation in January 1992, state enterprises continued to deliver goods to dud enterprises without making any effort to assess their creditworthiness and thus simply relying on the soft budget mechanism of payment demand. State enterprises were clearly not ready for the market economy. A comparison of the kartoteka-2-files (unpaid payment demand) and Goskomstat-data on receivables (see table IV.1.) shows that indeed the payment demand system failure was closely linked to the explosion of IED in the second half of 1992. The kartoteka-2 system was abolished in July 1992 and the accumulated debt was cleared through the normal payment system (see section 3.3.). We think that also the lack in banking competition and the technical backwardness contributed to the crisis of IED. The lack of banking competition allowed both commercial banks and the central bank to slow down payments and assume a share of the inflation tax. Long distance postal communication and manual processing probably had a major influence on payment delay in 1992. However, these are merely assumptions, which cannot be supported by data.

3.2.2. The role of the payment system in interenterprise debt after the crisis

3.2.2.1. Theoretical and methodological issues

The empirical question is whether IED are influenced by the payment system also after the 1992 crisis, say in 1994. If they are, then there must be a positive relation between IED and float money in the payment system. Differences in IED-levels between Russian regions must then be explained by differences in bank float. In this section we will analyse whether the data support this hypothesis.

As a first exploration one would like to know whether IED and payment float are correlated. Ideally we would like to regress IED in months of GDP of a certain region on a constant and on float money in months of payment volume. However, no trustworthy regional data exist on regional GDP or regional payment volume. Therefore we performed an OLS of IED per capita on a constant and on float money per capita across regions. Results are in table IV.2.

Second, we are interested in the bank-related determinants of bank float. What determines the differences in the level of float money? Sunderarajan (1994) found evidence for the fact that float money in the payment system is influenced by credits of the central bank to the central state. The distribution of these credits through the payment system is a significant determinant of float money. He also finds a break in the relation in March 1993. Several reforms of the payment system resorted effect only then. However, inflation was not a significant determinant in his analysis. We consider some other determinants that are useful to our analysis. First we point at the possible lack of telecommunication and the consequent use of mail to transfer payment documents. Unfortunately telecommunication is difficult to measure. If telecommunication is still deficient, then the distance between payer and payee will determine the level of float money. We also know that most payments are destined for a payee in the same region or in other words most payments are local or regional. Therefore we can use the **population density** in a region as a measure. A lower regional population density is equivalent to a higher expected distance between payer and payee for regional payments. Therefore we expect a negative coefficient for population density. Furthermore, it is straightforward that banks will first invest in regions with high population density. Therefore in those regions banking will be better developed. The development of the banking system is the second factor we analyse: Have banks developed a competitive network of branches? We measure this by the **number of bank branches per capita**. A last proxy is based on the idea of contestability. Are banks large enough to contest the payment settlement system of the central bank and to found their own system of correspondent banking and clearing? We try to measure this by the **average nominal capital of banks**. We thus performed a regression of IED per capita on a constant, population density, the number of bank branches per capita and the average nominal capital of banks in a region. Results are reported in table IV.3.

Large problems emerge with the prediction of the sign of the last two variables. We expect the coefficient of bank branches per capita to be negative, because the introduction of bank competition urges banks to speed up payment settlement (and therefore creates lower IED). However, if the coefficient turns out to be positive or non-significant, the implications are troublesome. Maybe we are wrong and the lack of a branch network and thus deficient bank competition has nothing to do with float money. Or maybe it has to do with it, but bank competition has not

developed in any region yet. It is also possible that regional differences in the economic activity interfere in the relation. In regions that experience lower falls in real production, both the volume of payments (and thus float money) and the number of bank branches per capita may be higher than in regions with higher production falls. The coefficient would then be positive since both variables mirror regional differences in economic activity. Unfortunately we have no trustworthy data on regional GDP per capita to control for this.

For the coefficient of the average nominal capital of banks we expect a negative coefficient : Small banks cannot contest the official payment system managed by the CBR. The CBR knows this and uses its knowledge to slow down payments. However the CBR cannot afford this attitude in regions where banks are larger. If the coefficient turns out to be positive or insignificant, a conclusion is again troublesome. Explanations comparable to the previous variable seem to be reasonable (e.g. the CBR payment system is not contested by commercial banks yet, interference of regional differences in economic activity). Yet another explanation is possible. A positive relation between bank volume and float money per capita may indicate monopolistic behaviour of commercial banks. Large banks do not contest the monopoly of the CBR payment system but join it and slow down payments in order to increase their share of the inflation tax.

Last, we try to analyse the direct relation between IED and bank characteristics. Therefore we regress IED per capita directly on a constant, population density and on the average nominal volume of banks, to check whether the relation holds.

We used regional data of the 12 Russian regions on IED, float money, population density, number of bank branches per region and average nominal bank capital of a region. Data on IED and population density are from Goskomstat, all other data are from the CBR[11]. IED are in millions, while float money is in billions. We repeated the analysis for two points in time, namely end of March 1994 and end of July 1994. Strictly statistically t-statistics cannot be interpreted correctly, due to the limited number of observations (12). Therefore one should be cautious not to draw firm conclusions.

3.2.2.2. Presentation of results and interpretation

The results in table IV.2. suggest that regional differences in the level of float money explain about 80-90% of regional differences in the level of IED. Moreover the coefficient for float money is significant at any wanted level. This supports the thesis that IED are still influenced by float in the payment system. Once again we stress that one should be very cautious with conclusions, because the data basis is weak. A more appropriate approach would be, to analyse how changes in the level of float affect changes in the level of IED over time and across regions. However, two problems arise. First, we only have data on float money from end 1993, which means that the time series is too short. Second, one can expect such a relation to be very unstable, because the developments in Russian banking would certainly affect the relation, if there is any. Indeed, the efficiency of the payment system is in constant flux. Therefore a pooled regression may not make much sense.

Table IV.2. The relation between interenterprise debt and payment float

IED per capita = c(1) + c(2)*float money per capita + ê

Point in time	Adjusted R^2	constant c(1)	float money pc c(2)
End of first quarter 1994 12 regions	0.899	0.07 * (1.89; 0.087)	0.0019 *** (9.93; 0.000)
End of second quarter 1994 12 regions	0.835	0.097 (1.463; 0.174)	0.0015 *** (7.52; 0.000)

White heteroskedasticity-consistent standard errors & covariance
For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.
T-statistics and t-probability are in brackets.

Table IV.3. Determinants of float money per capita

Float money per capita = c(1) + c(2)*population density + c(3)*average nominal volume of banks + c(4)* Number of bank branches per capita + ê

Constant	Population density	Average nominal volume of banks	Number of bank branches pc	Adjusted R^2
Results for estimations end of March 1994				
157.6 (1.797; 0.110)	-3.658 ** (-3.221; 0.012)	0.174 (1.037; 0.33)	722.3 (0.875; 0.407)	0.444
129.375 (1.608; 0.142)	-3.332 ** (-3.147; 0.012)	0.251 (1.769; 0.111)		0.458
Results for estimations end of July 1994				
232.58 (1.833; 0.104)	-6.026 *** (-3.418; 0.009)	0.2627 (1.584; 0.152)	1117.024 (0.866; 0.412)	0.583
183.51 (1.639; 0.136)	-5.365 *** (-3.424; 0.008)	0.351 ** (2.714; 0.024)		0.594

White heteroskedasticity-consistent standard errors & covariance
For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.
T-statistics and t-probability are in brackets.

In table IV.3. we show the estimated relation between float money per capita and its determinants. Multicollinearity between number of bank branches per capita and the average nominal volume of banks urged us to repeat the estimations without the number of bank branches per capita. The constant turns out to be insignificant. The estimated coefficient for population density is significant and shows the expected negative sign. This confirms the hypothesis that physical distance plays a major role in the speed of payment processing. The technical backwardness impedes fast payment settlement and causes payment float and IED. The other coefficients however do not show the expected sign. So we do not find any support for the idea that regions with a higher development of commercial banking have more bank competition, faster payment settlement and thus less float money. However, we did not find support for the opposite either. The positive coefficient can possibly be explained by regional differences in economic activity. Higher economic activity stimulates a faster development of commercial banking, and also causes a higher amount of float money per capita, because both the payment

volume per capita is higher and the payment system may be congested by this higher volume. Also, it is possible that the positive coefficient for the average nominal capital of banks reflects monopolistic behaviour by banks.

Table IV.4. Interenterprise debt per capita explained

IED per capita = c(1) + c(2)*population density + c(3)* average nominal bank volume

Constant c(1)	Population density c(2)	Average nominal volume of banks c(3)	Adjusted R^2
Results for estimations end of March 1994			
0.304 (1.868; 0.095)	-0.006 (-2.99; 0.015)	0.000497 (1.733; 0.117)	0.432
Results for estimations end of July 1994			
0.365 (1.883; 0.092)	-0.008 (-2.97; 0.016)	0.000517 (2.311; 0.046)	0.51

White heteroskedasticity-consistent standard errors & covariance
For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.
T-statistics and t-probability are in brackets.

The results of the analysis of direct links between float and bank characteristics are presented in table IV.4. They confirm earlier findings. Population density and the average bank volume influence IED. This suggests that technical backwardness and possibly monopolistic bank behaviour slowed down payments in 1994. There are no signs that bank competition in the field of payment settlement has emerged in Russia. As mentioned before, the data basis for this analysis is very weak, so we should consider the results to be indications merely.

3.2.3. The role of interenterprise debt in payment delays

In this section we analyse whether the clearing of IED in the second half year of 1992 contributed to payment delays. We will analyse how the netting process was precisely implemented and show that it certainly contributed to payment delays. This section draws entirely on the interim reports of the missions of EES-AGIR for policy advice on IED.

The CBR initiated the netting mechanism by its decree of July 28th 1992. Before we describe some details, we stress that the netting mechanism addresses only the unpaid payment demands on the kartoteka-2-files of state enterprises as they existed on July 1st 1992. So it was a clearing of (overdue) unpaid payment demands rather than a clearing of IED.

The netting mechanism involves state enterprises, commercial banks and RKT. Both RKT and commercial banks had to open *special accounts* through which the clearing would be channelled. RKT opened sub-accounts of the standard correspondent account (the so-called 160 account) for each bank that was involved in the netting. Commercial banks had to open special accounts for each state enterprise that showed up in their kartoteka-2-files, namely so-called 725 accounts for unpaid payment demands within Russia and 721 accounts for interrepublican unpaid payment demands (debts with regard to state enterprises in other countries of the CIS). Then the banks had to determine whether a state enterprise-customer of the banks was a net

debtor or a net creditor. The state enterprise had to produce a list of the unpaid payment demands which were receivable from other state enterprises as at 1 July 1994. The banks could calculate themselves from their kartoteka-2-files, the sum of unpaid payment demands which the concerned state enterprises had to pay to other state enterprises. So unpaid payment demands to private enterprises or to the budget were not taken into account. With this information the banks could determine the net position of every single state enterprise.

Once the net positions were known, the second phase of the netting could start. If a state enterprise was in a net credit position, all unpaid payment demands on its kartoteka-2-files were effected. If a state enterprise was in a net debit position, the unpaid payment demands on its kartoteka-2-files were only effected up to the amount that the enterprise had to receive from other enterprises in the clearing process. So possibly net debit positions of state enterprises remained unsettled. According to the decree all payment documents for the netting should be put into the system before 20 August 1992.

In the following phase the payments were settled according to standard payment procedures of the RKT-system, with two minor changes, namely the payments were booked in the special accounts, mentioned before, and all payment documents issued in the netting process were marked with a red 3. Note also that this third phase of the netting was intended to be a pure accounting operation. This is mirrored in the fact that no interest payments were due on the special accounts. The idea was to reduce the stock of payables and receivables of every state enterprise to net positions.

The last phase of the netting was initially scheduled for 5 October 1992. At that date enterprises with net debit positions had to provide funds to cover the debit balances, either by depositing money with their current account or by receiving a bank loan. The commercial banks could draw for these 'soft' loans on special credit lines, created by the CBR for this purpose. Enterprises that ended up with net credit positions on their accounts would receive a transfer of the net credit position on their current account. In effect this amounted to a monetisation by the CBR of net arrears.

This is how the netting was designed. Reality was however different. Very early it became clear that the netting mechanism was seriously flawed in various aspects. First, the RKT-system was incapable to swallow the enormous flow of documents created by the netting process. The settlement system was congested by an overkill of documents to be settled, and anecdotal evidence suggests that average payment periods almost doubled in the second half of 1992. This caused delays, not only for the settlement of standard payments, but also for the time schedule of the netting. Deadlines were overruled and postponed several times and nobody seems to know when exactly the process was really finished.

Second, there is a fundamental conceptual mistake in the mechanism. In practice it is impossible to determine whether an enterprise has a net credit or a net debit position. An enterprise may have a net credit position, but a share of its unpaid payment demands is due by enterprises with a net debit position. Since for enterprises with a net debit position, due payments are only effected to a certain maximum (the credit position), the claiming enterprise (possibly with a net credit position) cannot be sure whether it will receive the concerned payment or not. More generally the decree did not clarify who decided, in the case of a net debtor, what payments

precisely would be effected and what payments would remain unsettled. Therefore, there were several cases where enterprises, that theoretically had a net credit position, ended up with a net debit position on their 725 account with the bank. Often it was very difficult for the enterprises to find the cause for this. Is it due to the fact that some payments were not effected (net debit position of the debtor), or are the effected payments stuck or lost in the chaos of the RKT-system ? All this made the netting a long and unclear process.

The CBR issued a new decree on October 15th, 1992 (after the official end of the netting, according to the original decree). This decree provided a new end for the netting mechanism. Credit balances on the 725 account, that were transferred to the current account in the first decree, are now strictly controlled. An enterprise could only receive funds in order to cover some priority payments, such as debit positions on 721 accounts, debts to the budget and debts to the commercial banks. All credit positions exceeding these priorities were frozen on the 725 accounts. Also for companies with debit balances the new decree was stricter. If the company had credit balances on its current account the bank had to use these funds to bring down the debit balance on the 725 account. If the funds were not available there was again a procedure of loans. This could have strange consequences. An enterprise that starts with a net credit position can for several reasons end up with a net debit position and either lose the funds on its current account, or even be obliged to borrow from the commercial banks in order to cover this net debit position.

The clue to the influence on payment settlement is straightforward. The netting mechanism was routed through the RKT-system in a way that was analogous to real payments. The additional flow of documents into the RKT-system caused large capacity problems in many RKT and slowed down the payment settlement and the netting itself.

4. The payment system for interrepublican payments

4.1. The chaotic monetary constitution in 1990-July 1992 : the ruble zone

In Soviet times interrepublican payments were identical to domestic Russian payments. They were routed through the Soviet MFO-system, as described above. The only technical difference was the additional involvement of the republican branches of Gosbank in the settlement process. This setting changed in the early nineties.

From 1990 on the Gosbank started to lose control over its 15 republican branches. A growing number of republics openly envisaged or even openly declared their sovereignty. As in many other fields the Baltic countries started the rebellion. In chapter II we showed that Russia took the lead of the rebellion in December 1990, when it voted a law on the central bank and banking activity, that was in contradiction with the Union law of some days later. This process escalated in December 1991. The USSR ceased to exist and all republics became independent (new independent states or NIS). Gosbank ceased to exist as a unified structure and its former republican branches became the central banks of the NIS. These new central banks continued to supply credits to agricultural enterprises, state-owned industrial enterprises, banks and governments. A hybrid monetary system emerged. The creation of cash rubles came exclusively in hands of the Moscow-based Russian Central Bank (CBR). Non-cash rubles could however be issued by each of the new central banks of the NIS by granting central bank credits. This gave

birth to an evident free rider problem. Every NIS could be expected to expand central bank credit, since the benefits of monetary expansion would accrue to the expansionary NIS, while the burden of inflation could be expected to spill over to the other members of the ruble zone through payments for intra-republican trade. (Havrylyshyn and Williamsom, 1991). This perverse incentive to expand is stronger for small republics, since they can reap a given benefit in % of GDP at a smaller opportunity cost in terms of higher inflation. In order to reap an equal benefit in terms of NMP, larger republics will have to create more money and the union-wide money supply will raise more. Hence the inflation cost will be higher for them. These conclusions also hold for the other countries involved. The damage to all other NIS of monetary expansion by one of the NIS will be larger if the expansionary republic is larger. Therefore one would expect that small NIS are more urged to expand money supply than large NIS, because their inflation cost will be lower and the damage done to others will be lower too. Such a setup carries a lot of inflationary potential. It was commonly referred to as "the worst monetary constitution one can imagine"[12]. Empirically it is interesting to see whether Russia did suffer from this awkward monetary constitution in the form of higher inflation. Many influential authors claim that Russia indeed bore an inflation cost of this setting (see for example Koen, V. and Marrese, M., 1995; Åslund, 1993). This can only be true if monetary policy was more expansionary in other republics than in Russia. This may have been the case in 1990 and 1991. However Gros and Steinherr (1995) show clearly that this was not the case in 1992. During 1992 monetary policies in ruble zone countries have actually been less expansionary than in Russia, with a distinct exception for Ukraine. One can confidently say that the Russian inflation in 1992 was mainly due to the expansionary policy of the CBR itself, rather than to spill-over effects through interrepublican payments, with the notorious exception of Ukraine. The analysis of Gros and Steinherr (1995) actually shows that the two biggest ruble zone countries (Russia and Ukraine) were the most expansionary countries. One may conclude that their lax policies have hurt the smaller ruble zone countries more than they have been hurt themselves by the lax policies of these smaller countries. It may be true however that the lax Russian monetary policy in the second half of 1992 was to a large extent due to the huge CBR credits to CIS-countries.

4.2. The correspondent accounts since July 1992

This hybrid system was soon abolished. At the heart of the CBR, the "worst constitution one can imagine"-scenario was conceived as realistic and feared. This was in a way legitimate because monetary policy of the CBR in the first half year of 1992 was in fact quite strict. Unfortunately the hybrid system was replaced by an even worse system. Already on the 1st of January 1992 commercial banks were obliged to settle all transactions with former republics through correspondent accounts at the CBR. Settlement was in theory conditional on the availability of funds (Granville, 1993). Nevertheless, the CIS countries were allowed to accumulate large payment deficits in their trade with Russia during the first half year of 1992. These deficits were automatically credited to the recipient Russian enterprises by the CBR since there was no efficient system to record them. This followed from the inherited USSR payment system. The IMF (1994) explains the matter more in detail: "..., each branch of Gosbank had correspondent accounts with virtually every other branch, so that it was always possible to know whether a given branch was in deficit or in surplus with the rest of Gosbank. However, the system was not set up to track 'regional' balance of payments as opposed to 'branch' balance of payments." (IMF, 1994, p. 33). As a consequence the CBR was informed only afterwards about the balances and the trade balances were financed with CBR payment over-

draft (which is in fact pure non-cash ruble expansion) and interstate IED. In April 1992, the processing of interstate payments was centralised in the regional offices of the CBR[13]. On 12 June 1992, Ukraine gave its economy a huge credit injection to solve IEA. Russia feared the inflationary impact on its own economy and the signalling function of the credit expansion in Ukraine as an example for other ruble zone countries. As a reaction, in July 1992 all interrepublican payments were centralised in Moscow by forbidding other RKT to handle any CIS payments[14]. Also the CBR founded a special department for inter-CIS payments as part of the Information Technology Department of the CBR (Sensenbrenner and Sunderarajan, 1995). The installation of centralised correspondent accounts allowed the CBR to monitor and restrain the dynamics of payments imbalances in interrepublican trade with regard to their influence on Russia's monetary supply. Two measures were crucial to the decree. 1) The CIS countries could only credit these correspondent accounts (pay for Russian imports) if they had sufficient funds on the debit side (from export to Russia), or in other words the correspondent accounts had to be balanced over time. The rationale for this balancing requirement was straightforward. If Russia could prohibit net movements of funds from other countries to Russia, then credit emission in those countries could not -as feared- affect the money supply in Russia. Off course one could not expect balance right away. Therefore the other crucial point of the decree was that 2) Russia granted every CIS country a line of credit at the start in order to provide room for structural adjustment[15].

For various reasons the credit lines were exhausted quickly, for some countries already within three months after the establishment of the credit lines. One of the reasons may have been the soft creditor reputation of the CBR. The CIS countries probably gambled that the CBR would be weak and raise the credit limit, as it had done in the past. They rightly did so because Viktor Gerashenko had been appointed Chairman of the CBR in July 1992 and he indeed allowed the technical credits to rise beyond any limit[16]. The central problem for Russia was the soft policy of Gerashenko. This also applied to cash rubles. While before July 1992 there had been a severe cash squeeze, this changed radically in the second half of 1992 and cash was delivered on demand to the ruble zone countries. Note however that cash deliveries were also accounted for as technical credits by the CBR. The credit lines were abused by the CBR and Russian enterprises to expand the domestic money supply. So the system of the obligatory balanced correspondent accounts combined with the technical credits could not stop the flow of credit from Russia to the republics in 1993 because of the double-edged role of the CBR, as can be seen from table IV.5.

Therefore the system was changed in April 1993. All standing technical credits were converted into state to state debts, denominated in US dollars and with LIBOR interest rates and managed by the Ministry of Finance instead of the CBR. Also credit lines were opened for the remainder of 1993, but they were tied credits for buying specific Russian goods and they were subject to approval of the CBR (Granville, 1993). These changes limited the discretionary power of Gerashenko of the CBR.

Table IV.5. The Russian correspondent accounts by end 1992

| | Correspondent account balance by end 1992 in bn rubles | | |
	excluding cash rubles (1)	including cash rubles (2)	(1) as % of GDP
Armenia	9	35	12.8
Azerbaijan	34	51	17.4
Belarus	69	102	7.2
Georgia	38	69	28.4
Kazakhstan	235	407	14.8
Kyrgyzstan	20	42	10.9
Moldova	18	27	7.5
Tajikistan	17	36	42.5
Turkmenistan	111	172	34.4
Ukraine	862	862	21.7
Uzbekistan	117	292	28.1
Source : Adapted from IMF (1994), p. 26.			

Gros and Steinherr (1995) describe how the system worked in practice. Every CIS-based importer of Russian goods transferred payment orders for import from Russia to its local bank, which in turn sent it to the country's national bank. The respective CIS national banks periodically sent a batch of payment orders to the CBR in Moscow. The payments from the CIS importer were booked on the liability side of the correspondent account with the country concerned while Russian payments for Russian imports from that country were booked on the asset side of the correspondent account.

This approach of the correspondent accounts had some obvious disadvantages. As a result the trade between CIS countries was seriously hampered. In practice there was a lot of confusion and additional delay due to the reform. The implementation of a more centralised system increased and slowed down the payments traffic between Moscow and the Russian regions. A lot of payment documents got lost between the two systems and had to be rerouted. Also all the arguments about the inefficiency of the centralised RKT-system (see section 2.4. and 2.6.) hold. Add to this that the settlement of inter-CIS payments via correspondent accounts became unreliable, as a consequence of the unpredictable blocking of payments by the CBR because the correspondent account concerned was in deficit. As a consequence even liquid enterprises could in some cases not purchase the required Russian inputs because their country as a whole was in deficit and thus payments were blocked. The system clearly affected the efficiency of the allocation of goods. More structurally, the practice of correspondent accounts put the additional constraint of bilateral balancing on intra-CIS trade. Such a crackdown from multilateral balancing to bilateral balancing is potentially harmful to trade and welfare. We show the point by means of a simple example. Assume that a Republic A has a deficit with Russia but a surplus with other republics, with its intra-CIS balance of payments in equilibrium. Bilateral balancing would reduce Republic A's import from Russia and its export to all other countries. Republic A's domestic producers would be hurt by lower revenues from export to CIS countries and lower supplies of intermediary and primary goods from Russia.

There are some arguments that indicate that the harm done by bilateral balancing is substantial. An important factor is the stickiness of the FSU trade structure. One can reasonably assume that the trade structure of the FSU could adjust only slowly. The widespread monopolistic organisation of Soviet industrial production as a consequence of the Soviet location policy of industrial production is the main culprit for this lack of flexibility[17]. During 1992-1993 economic reforms in Russia and the introduction of the correspondent accounts in July 1992 enforced an abrupt price adjustment and bilateral balancing, which must have been suboptimal. The stickiness of the Soviet trade structure suggests that the optimal adjustment path to a new structure of trade would have been far more gradual than the actual shock adjustment in 1992-1993. It is easy to give examples[18]. On the other hand it is clear that the Soviet distorted trade pattern had to change anyway because of the abolishment of central planning and the transition to market practices. Gros and Steinherr (1995) showed that, according to existing gravity models, liberalisation of foreign trade would inevitably redirect Russian trade towards the West. Simple DOT-data even suggest that this redirection of trade started already before the big bang of January 1992. Tarr (1994) estimated the terms of trade effect on interrepublican trade from the introduction of world prices. He finds that one may expect major shifts in the interrepublican terms of trade[19] and hence adjustment. We however argue that this adjustment should have been based on deliberate responses of enterprises to altered incentive structures, rather than on an artificial crackdown of interrepublican trade due to a payment system failure. Payments to the NIS were settled slowly and unreliably or became impossible. Compared to this, payments to third countries were relatively simple and fast.

4.3. Measuring the adverse effects of bilateralism

4.3.1. Methodology and data

We estimate the loss of trade that would have occurred if the shift to world prices and the constraint of bilateral balancing would have occurred in January 1988. This estimation is a good indication of the order of magnitude of the shock in 1992, especially because of the stickiness explained above.

For these estimations one needs interrepublican trade data. In the literature interrepublican trade data from 1987 are used. These data were collected by Goskomstat in tempore insuspecto and are the only reliable data available. Because of the stickiness of the Soviet trade structure they should be a good approximation of the structure of interrepublican trade in 1991-1993. A prospective analysis shows that the 1987 data are indeed representative for the trade structure in 1992-1993[20].

The first step is to convert the ruble denominated Goskomstat data to world prices to see the effect of world prices on interrepublican trade. For most commodities Goskomstat supplies data on export prices received by the FSU. These prices are representative for world market prices. These world price data were used to calculate (roughly) a matrix for interrepublican trade in export prices. The result is a 12x12 matrix of all trade flows between NIS (the Baltic countries excluded) in 1987 and at world export prices. This basic matrix is identical to the matrix used by Gros and Dautrebande (1992). We refer to these data as **matrix 1**.

There is an important bias to be expected from this data set. The Russian interrepublican trade surplus in 1987 is mainly due to the fact that Russia was a large net exporter of gas, oil and energy in general. In the case of world prices and structural adjustment this export was expected to be redirected to the domestic market or to the more profitable Western markets. Therefore we should eliminate this structural deficit for the use of our calculations.

We propose two methods to perform this correction :

1) Starting from matrix 1, we can construct a matrix where Russia is assumed to be in multilateral balance with the republics, by proportionally reducing Russian exports to the various republics to the effect that total Russian interrepublican exports equal total Russian interrepublican imports. The republics are however allowed to be unbalanced among each other. This delivers a new trade matrix that is multilaterally balanced for Russia. We call this data set **matrix 2**. Matrix 2 comes in some variants. Anecdotal data show that in 1992-1993 Russia was still running a surplus in its trade with the NIS. Therefore we could add hypotheses concerning the % by which Russia reduces its surplus, say 100% (**matrix 2a),** 85 % (**matrix 2b)**, 70% (**matrix 2c)** or 50% (**matrix 2d).**

2) The proportional attribution of the Russian trade surplus is off course too rough an approximation. In matrix three we apply a more refined method. We take into account the latest reliable data for interrepublican trade in oil, gas and coal. In 1990 there existed no reliable matrix for interrepublican trade. However there still was a reliable data set on interrepublican trade in energy (mainly power, coal, gas, oil, and other fuels), because these goods were still strongly controlled by the state. We use the Goskomstat data set on interrepublican trade in energy, as reported by Michalopoulos and Tarr (1992). For every republic we calculate the 1990 interrepublican balance for trade in oil, gas and coal. These balances are used to construct weights, attributing a weight of zero to surplus countries[21]. The zero weight countries are Azerbaijan, Turkmenistan and Uzbekistan. The structural Russian surplus in matrix 1 is then dissolved by subtracting it from Russian exports to the various NIS with the use of these weights. This delivers **matrix 3**.

The last method fits reality better than the method of matrix 2. One could object to the zero weights for Azerbaijan, Turkmenistan and Uzbekistan. The rationale for this is as follows. These countries may have had a surplus in energy trade, but do not have a structural overall surplus in interrepublican trade. They need their interrepublican exports of energy to finance ditto imports. Also they were not able to redirect energy exports to the West in the short run, because the infrastructure (pipelines, harbours etc.) was deficient. Matrix 3 comes in some variants. We can reasonably assume that Russia's structural surplus is solved only partially through lower energy exports, for Russia kept running surpluses throughout 1992-1993. Therefore we let the structural deficit decrease with 100% (**matrix 3a)**, 85% (**matrix 3b)**, 70% (**matrix 3c)** and 50 % (**matrix 3d)**.

So we have 1 data set that is adjusted to world prices and 8 data sets that are additionally corrected for the structural Russian surplus according to various assumptions. Starting from these 9 data sets we can analyse the effect of bilateral balancing on trade. There are basically two methods to do this:

1) Kaplan and Schleiminger (1989) suggest to compare the absolute value of bilateral balances to the absolute value of multilateral balances. We calculate two measures, namely the ratio of bilateral to multilateral balances and the difference between bilateral and multilateral balances, divided by GDP. The ratio's are calculated for the 9 data sets. The interpretation is straightforward. The higher the ratio, the more serious the barrier to trade. The rationale is that all balances have to be financed. Bilateralism ceteris paribus induces higher balances to be financed and thus, assuming an upper boundary on financing potential, hampers trade. The assumption of an upper constraint to financing potential fits very well the practice of the correspondent accounts, with the limited technical credits that were exhausted very quickly. The results are reported in table IV.6., panel a, column 4 and 5.

2) A second method is to calculate a bilaterally balanced trade matrix. Technically this amounts to selecting for every trade relation the lowest number of import and export. Then we compare the bilaterally balanced matrix to the original multilateral one and calculate the loss of export in % and the loss of export in % of NMP, due to the bilateral balancing constraint. This method fits the system of correspondent accounts that indeed enforced bilateral balancing. The two measures are calculated for all former republics separately and for the FSU. The measures for the FSU are reported in table IV.6., panel a, column 2 and 3, and for Russia in column 6 and 7. We chose to report only Russia here, because it is the subject of research.

In order to interpret the results of this analysis, we must compare them to a benchmark. We propose post-world war II (WWII) Europe as the appropriate benchmark. After WWII, the European economy was a war economy. Some of its characteristics are analogous to those of the post-Soviet NIS economies. We indicatively mention obsolete capital stocks, lack of capital investment, high inflation, conversion of the military industrial complex to civil purposes, the lack of consumption goods and trade on the basis of inconvertible currencies and bilateral agreements. Europe countered bilateralism by establishing the European Payments Union (EPU) in July 1950 (Kaplan and Schleiminger, 1989). The EPU was among other things a multilateral clearing agreement that stimulated multilateral trade in Europe. It also provided for technical credits to facilitate adjustment of deficit countries. In late 1958 current account convertibility was generally restored and the EPU was dissolved.

We apply method 1 and method 2 to trade between the original 16 EPU-countries[22] in order to compare our findings for Russia to historical standards. Exactly like for the FSU we constructed a trade matrix for trade flows between EPU-countries. Trade data are import data in dollars from the IMF's publication *Directions of Trade*. We used data for 1949, 1950, 1951, 1952, 1953, 1954 and 1955. This leaves us with 7 16x16 matrices of EPU-trade. GNP-data are from the IMF's publication *International Financial Statistics* (IFS). We applied method 1 and 2 to these 7 matrices in exactly the same way and separated the leading EPU trade country, namely the United Kingdom (UK).The results for the EPU are in table IV.6., panel b, in the same columns as for the FSU.

4.3.2. Presentation of results and interpretation

Table IV.6. The possible harm done by bilateral balancing

Panel a							
Data set	trade/ NMP (1)	Export loss in % (2)	Export loss in NMP (3)	Kaplan & Schleiminger (4)	in NMP (5)	Export loss in % (6)	Export loss in NMP (7)
Former Soviet Union						**Russia**	
Matrix 1	27.5%	24.9%	6.8%	1.3	2.9%	38.3%	8.6%
Matrix 2a	22.1%	15.2%	3.3%	1.8	2.9%	10.9%	1.5%
Matrix 2b	22.9%	13.7%	3.1%	1.4	1.9%	13.2%	2.0%
Matrix 2c	23.7%	14.0%	3.3%	1.3	1.6%	16.9%	2.8%
Matrix 2d	24.8%	17.2%	4.3%	1.4	2.6%	24.2%	4.4%
Matrix 3a	22.1%	23.0%	5.1%	1.9	4.7%	20.8%	2.9%
Matrix 3b	22.9%	20.3%	4.6%	1.6	3.4%	21.1%	3.2%
Matrix 3c	23.7%	17.9%	4.2%	1.4	2.2%	21.4%	3.5%
Matrix 3d	24.8%	16.8%	4.1%	1.2	1.5%	23.7%	4.3%

Panel b							
Data set	trade/ GNP (1)	Export loss in % (2)-	Export loss in GNP (3)	Kaplan & Schleiminger (4)	in GNP (5)	Export loss in % (6)	Export loss in GNP (7)
EPU						**United Kingdom**	
1949	6.9%	20.7%	1.4%	2.1	1.5%	15.9%	0.8%
1950	7.0%	19.2%	1.4%	2.3	1.5%	20.9%	1.0%
1951	8.0%	21.3%	1.7%	1.7	1.4%	13.2%	0.7%
1952	7.3%	17.7%	1.3%	1.8	1.1%	10.7%	0.5%
1953	7.2%	19.5%	1.4%	2.2	1.5%	13.0%	0.6%
1954	7.2%	21.2%	1.5%	1.8	1.3%	22.2%	1.0%
1955	7.6%	20.3%	1.5%	1.9	1.5%	20.1%	0.9%

The interpretation of these results is subtle. Column (1) shows that the FSU was much more dependent on intra-FSU trade than was the EPU on intra-EPU trade. Off course NMP and GNP are not totally comparable identities[23]. Still it is clear that FSU-dependence on FSU-trade is greater than EPU-dependence on EPU-trade. This is among others due to historical circumstances. European countries were still recovering from WWII and were typically isolated and disintegrated economies. The starting point was relative disintegration. The FSU on the other hand had been isolated from the world economy and had developed a very integrated economy with high interdependency. If we neglect the strongest assumptions (matrix 1, 2a and 3a) we see that the export loss due to bilateral balancing (panel a, column 2) may have been somewhere between 15% and 20%, while in % of NMP (panel a, column 3), the loss must have been between 3% and 5%.

Comparing to EPU-experience (panel b), we see that the loss of export due to bilateral balancing would in the EPU as a matter of fact have been more severe in terms of export loss (around 20 % in 1949-1951), but less severe in terms of lost GNP (always around 1.5%). The difference is off course due to the different degree of trade integration. We also observe that, in terms of NMP, Russia seems to lose less than the other FSU-countries (comparing column 2 and 6 in

panel a). This is due to the fact that Russia was the least dependent on FSU-trade of all FSU republics. This again is easily explained by Russia's scale and vast natural resources. So, the consequences of bilateral balancing seem to have been serious for the FSU, but less serious for Russia than for others.

4.4. The payments union and the Interstate Bank

Looking at the destructive effects of bilateralism identified above, one might conclude that a payments union would have been a useful institute for the CIS. Already at the time of the demise of CMEA, several authors had proposed an East European Payments Union (Bofinger ,1990; Kenen, 1991, and others). When the Soviet Union fell apart several authors followed this line of reasoning and argued in favour of a so-called 'Soviet Payments Union' (SPU) on the ground of economic arguments (Van Brabant; 1991; Gros, 1991; Havrylyshyn and Williamson, 1991). In all this literature the European Payments Union (EPU) was referred to as a benchmark. Other authors strongly argued in favour of the ruble zone. Amazingly the IMF was a long time in this position (IMF, 1992). Duchêne (1994) finds no economic grounds for the maintenance of the ruble zone. Åslund (1993) and Eichengreen (1993) argue in favour of a clean break with the Soviet Union and favour free trade and current account convertibility.

Eichengreen (1993) rightly claims that other factors than simply economic rationale lie at the heart of the success of the EPU. The EPU played a special, historically unique role in post-WWII Europe and fitted in the framework of European integration. The FSU on the other hand was moving in the opposite direction. He argues that the actual choice for the NIS is between bilateralism and convertibility. History seemingly proved him to be right. Still this does not exclude that a SPU could have been a useful and temporary instrument (as was the EPU). Indeed free trade and convertible currencies are the best safeguards against trade disruptions and it is clear that they should be the ultimate goal. However, the transition from the hybrid ruble zone to ultimate free trade and convertibility is not possible without serious disruptions. Therefore the SPU could have played a useful though temporary role. Note for example that at the time of splitting of Czechoslovakia in the Czech and the Slovak Republic, the two new countries agreed on a payments arrangement (see Baliño, Dhawan and Sunderarajan, 1994). The agreement allowed payments between the two countries to be cleared and settled through their central banks. The unit of account and settlement was the ECU. The agreement avoided the disruption of payments and provided a transitory mechanism between the former Czecho-slovak currency union and the final current account convertibility, without having to pass the phase of bilateralism[24]. This shows that one does not need the special historical context of integration for a payments union to work, as Eichengreen argues. Therefore we think that the failure of the SPU is due to other factors. We argue that 1) a SPU could have made a major contribution to the softening of the burden of transition from a purely economic point of view, but that 2) the feasibility of a SPU was low because of the specific post-Soviet environment with Russia as the dominant partner.

After the introduction of the correspondent accounts, Russia tried at several occasions to reestablish a kind of Post-Soviet Monetary Union (PMU). This did not succeed because of the disequilibrium in decision power between Russia and the other republics. In October 1992 minds were changing in favour of a multilateral payments and settlement mechanism. I was happy to be involved in the work of EES-AGIR[25]. In this function, I was an unimportant but

close witness of the rise and the demise of the so-called Interstate Bank (ISB). On 9 October 1992 there was an important summit of the CIS Heads of State in Bishkek, the capital of Kyrgyzstan. They concluded the famous Bishkek-agreement. This agreement called for a coordination of monetary, credit and exchange rate policies for all countries that retained the ruble as legal tender[26]. On the same date the heads of state decided to create a working party for the establishment of an ISB[27]. Initially the ISB was perceived in the western press as a kind of central bank for the ruble zone. Also some CIS-countries feared that it would become a kind of central bank, dominated by Russia. However the text of the decision explicitly calls for proposals for activities of the ISB that are related to the creation of a payment mechanism[28].

The last quarter of 1992 was devoted to the drafting of an agreement on the establishment of the ISB and on a charter for the ISB. Specialists of EES-AGIR and the IMF were deeply involved in the process of drafting. During the drafting it became clear that the ISB would indeed become rather an institution for multilateral interrepublican clearing and settlement than a bank. The ISB would be only a bank in the sense that it provides technical credits. On 22 January 1993 the heads of state signed a treaty in which they approved the proposed draft agreement and the ISB charter with two amendments. The amendments concerned the accounting and settlement unit and the distribution of voting rights. The unit of account became the ruble instead of a hard currency as proposed by the Western experts and the distribution of voting rights was changed so that Russia received 50% of the voting rights. The two amendments changed the heart of the agreement because they turned the ISB into a Russia-dominated institution instead of a neutral one, as it was initially conceived.

The ISB also provided a system of technical credit that was analogous to the one applied in the EPU. This allows deficit countries to gradually adjust their interrepublican trade deficits. Every member country received a technical credit limit. The limit was proportional to gross interrepublican trade of the country concerned. The charter provided also a settlement schedule. The proposed schedule was exactly the same as the EPU one. For the first 20% of the credit limit, cumulated monthly balances were fully credited. Then gradually, in layers of 20%, settlement in rubles was required. Cumulated balances exceeding the limit had to be fully settled in rubles. Such a gradual system of technical credit provides strong incentives for deficit countries to solve structural deficits, but still allows temporary trade deficits.

On 14 May 1993, the Heads of State called for the ratification of the agreement and the charter by the member states and set the deadline for the start of operations of the ISB on October 1, 1993. During 1993 the agreements and the charter were indeed ratified by the majority of countries and the ISB was formally founded. Unfortunately the agreement was never implemented. The ISB was founded but never showed any activity near to its mission.

How to explain this implementation failure? First of all, implementation failures were fairly general for CIS-agreements in 1992-1994. Second, we found in table IV.6. that the export loss in % of GDP as a consequence of bilateralism is lower in Russia than in the other republics. There is less at stake for Russia than for the others. Also the CBR controlled interrepublican payments through the, be it inefficient, system of correspondent accounts. Russia and specifically the CBR were reluctant to exchange this strong position for the more neutral ISB, while gaining only a relatively little efficiency. In short, Russia and the CBR were doubting the usefulness of the ISB and they were able to hamper the implementation since Russia had 50%

of the voting rights and the CBR was in practice staffing the ISB[29]. In post-WWII Europe on the contrary the dominating partner was the US, an outsider in favour of the EPU and the Bank for International Settlements (BIS). Third, in July 1993 the CBR unexpectedly introduced new cash rubles that were clearly Russian instead of Soviet. Since the common Soviet cash ruble was the last remainder of what used to be the ruble zone, this move forced all NIS to choose between becoming a province of Russia or leaving the ruble zone. All countries, excluded Tajikistan that was in civil war, decided to establish their own currencies. Gradually all countries established some form of convertibility to the ruble. This was the decisive step that settled the issue in favour of convertibility. We gathered all the relevant data on the erosion of the ruble zone from various Russian newspapers and the Economic Commission for Europe in table IV.7.

Table IV.7. The introduction of national currencies by the former republics

	PARALLEL CURRENCIES IN THE FORMER REPUBLICS						NATIONAL CURRENCIES (SOLE LEGAL TENDER) IN THE FORMER REPUBLICS					
	PARALLEL WITH THE OLD SOVIET RUBLE			PARALLEL WITH THE NEW RUSSIAN RUBLE			TEMPORARY VERSION OF NATIONAL CURRENCY			FINAL VERSION OF NATIONAL CURRENCY		
	name	date	rate	name	date	rate	name	date	rate	name	date	rate
Armenia							Dram	22/11/93	90 R : 1 DR	Dram	06/12/93	60 R : 1 DR
Azerbaijan	Manat	15/08/92	10 R : 1 MA							Manat	01/01/94	
Belarus	Rubel	05/92	10 R : 1 Rl									
Estonia							Zaichik	01/06/94		Kroon	20/06/92	0.125 DM : 1 Kr
Georgia	Coupon	04/93	1 R : 1 C				Coupon	02/08/93		Lari		
Kazakhstan										Tenge	15/11/93	500 R : 1 T
Kyrgyzstan										Som	01/05/93	200 R : 1 So
Latvia	Rublis	07/05/92	1 R : 1 Rs				Rublis	20/07/92		Lats	28/06/93	
Lithuania	Talonas	04/92	1 R : 1 Ta				Talonas	01/10/92		Litas	25/07/93	100 T : 1 Li
Moldova				Coupon & Lei	end 07/93					Lei	29/11/93	
Russia							Ruble	21/08/93		Ruble	01/01/98	1000 R : 1 R
							Pre 93-ruble	08/01/94				
Tajikistan												
Turkmenistan										Manat	01/11/93	500 R : 1 MT
Ukraine	Karbovanets	10/01/92	1 R : 1 Ka				Karbovanets	12/11/92		Hryvna	02/09/96	10,000 K : 1 H
Uzbekistan	Sum-coupon	15/11/93		Sum-coupon	06/12/93	1 R : 1 S-C	Sum-coupon	01/01/94				

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4.5. Interrepublican payments in practice : muddling through

The unreliability of CIS payments routed through the system of correspondent accounts stimulated the development of private initiative for settlement of CIS payments. This private initiative came not only from banks. The structure of Russia's payment relations looked as follows :

1. Mutual deliveries in the context of interstate agreements :
   - Linked deliveries within the quota and on the basis of clearing. This is essentially barter trade. There are no payments involved.
   - Deliveries above the barter quota, but with agreed upon quantities and prices. Payments are settled through the system of correspondent accounts.

2. Decentralised trade :
   - Payments are settled through the system of correspondent accounts.
   - Correspondent banking networks of commercial banks. Because of the limited convertibility of the currencies concerned, payment flows had to be balanced or settled in hard currency.
   - Barter in all its variants.
   - Cash (rubles, dollars or any other currency acceptable to both parties). Cash is widespread because of its speed, finality and lack of traces.
   - Non-banking mechanisms.

The economic journal Kommersant[30] describes some of these non-banking mechanisms. Some of these mechanisms were already operational in 1992. Around 20 large Russian firms seem to have specialised in CIS settlement. We describe some of these mechanisms. The description cannot be exhaustive because of the illegality of the operations and the consequent piecemeal information that can be found about it. The purpose is to give an idea of the payment environment enterprises had to work in.

1) A first method is the so-called 'balance-scheme'. An intermediary finds a CIS-based partner, often one of its branches, and payments are carried out on behalf of each other. The Russian partner pays the import of the CIS-partner from Russia and receives its export revenues in rubles. The CIS-partner pays the import of the Russian partner from the CIS-country concerned and receives the proceeds of Russian export to the country concerned. If payments are balanced, there is no problem. If not, there remains the problem of settlement of the final balances. Therefore this scheme is typically a small scale operation.

2) The settlement problem can also be avoided by means of the 'goods scheme'. Assume a net import of Russia from a CIS-country. Instead of settling payments with money, the Russian intermediary uses Russian payments to buy Russian tradable and exports these to the country concerned. There they are sold on the local market and the proceeds serve to pay for the import. The advantage is speed and feasibility. In 1992-1993, shipping goods took considerably less time than settling interrepublican payments and the obvious widely accepted Russian tradables are oil, gas and other scarce natural resources.

3) A third method is to swap payment flows. An intermediary finds two pairs of trading enterprises with opposite payment transactions. The payment flows are swapped from CIS-Russia and Russia-CIS to Russia-Russia and CIS-CIS. Advantages are the speed and the avoidance of any cross-border operations.

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4) Also large enterprises assumed bank functions. Sometimes payments were transferred through an intermediating large firm that was represented in both trading countries. A Russian enterprise pays its CIS-partner not directly, but it rather pays the intermediary and the CIS-branch of the intermediary pays the CIS-partner. In this way the problem of cross-border settlement is reduced to one of intra-firm settlement. In fact those intermediaries assume the role of correspondent banking in the absence of efficient correspondent banking structures.

Anecdotal evidence from newspaper reports indicated that the transaction costs for these payments were fairly high, sometimes up to 30%. This is no wonder, given the level of risk and the absence of an adequate legal environment that could cope with fraud or abuse.

4.6. The limited role of commercial banks

Commercial banks rapidly established correspondent account networks with CIS-banks and developed CIS-branch networks, though the official system of correspondent accounts initially forbade them to do so. There exists again only anecdotal evidence that banks did settle payments with CIS-countries through their own correspondent networks. They often used bilaterally agreed upon exchange rates between rubles from different CIS-countries. The fact that non-cash rubles were quoted differently across countries was just another manifestation of the de facto end of the ruble zone, already by end 1992. Soon these exchange rates of various non-cash CIS rubles to the Russian ruble were quoted by banks and financial newspapers[31]. Nevertheless the role of commercial banks was initially very limited.

However, when in late 1993 all countries created their own currencies and established some kind of convertibility with the Russian ruble, the involvement of banks in payment settlement grew. Note that MICEX soon quoted exchange rates of some of these national currencies to the ruble, such as for example the Kazakh Tenge and the Ukrainian Karbovanets[32]. This indicates that Russian banks had at least some level of operations in these currencies and thus some level of underlying transactions. We also found that most larger banks in sample B reported correspondent banking relations with other CIS-countries. Some even have branches in these countries. Unfortunately it is impossible to assess the extent to which these correspondent relations were in effect used to settle payments between the CIS-countries.

Notes of chapter IV

1. Largely based on the Interim reports of the Policy Advice group on Payment Arrears of the European Expertise Service (EES), and own interviews.

2. MFO is the abbreviation for Mezhfilialniy Oborot, which means 'Flow Between Branches'.

3. The first laws on commercial banking were voted in December 1990 and came into power only in 1991, as explained at length in chapter II.

4. RKT is the abbreviation for Raschotnie-Kassovie-Tsentri, which literally means Settlement-Cashier-Centres.

5. This type of payment is described in the telegram of the CBR of 11 August 1992, No. 18-612.

6. See the telegram of the CBR of 26 May 1993, No. 87-93.

7. See the telegram of the CBR of 20 November 1993, No. 248-93.

8. Kommersant-Daily of 24 November 1993, No. 226; Moskovskie Novosti of 24 November 1993, No. 48.

9. Kommersant-Daily of 27 November 1993, No.228.

10. The first laws on commercial banking were voted in December 1990 and came into power only in 1991. Nevertheless, the chaotic environment in 1991 (the coup against Gorbachev by backbenchers in August, the subsequent power struggle between Yeltsin and Gorbachev and finally the demise of the SU in December) and in 1992 (price liberalisation, trade liberalisation and so forth), combined with the lack of experience of the CBR in prudential control (in 1992 there did not even exist a department for bank control at the CBR) led to a legal and supervisory vacuum.

11. CBR, 1994, Bulletin of Bank Statistics, various issues.

12. This dictum is commonly attributed to Stanley Fisher.

13. See the letter of the CBR of 30 April 1992, No. 4.

14. See the decree of the Russian Federation of 21 June 1992 (effective 1 July) and the letter of the CBR of 9 July 1992, No. 14.

15. These technical credits were granted at zero interest rates.

16. At the end of June (before the appointment of Gerashenko that is) the stock of credits to former republics was 325 bn rubles, while at the end of 1992 the stock reached 1545 bn rubles (Granville, 1994). So in the second half year of 1992, credits to the republics rose with 375%, which was substantially more than the inflation in this period (175%), or the growth agreed with the IMF (66%).

17. For many products there was only one producer in the whole FSU with all republics being dependent on that producer. More generally there existed a centrally planned pattern of regional specialisation of industrial production. This pattern of regional specialisation was distorting because it was founded on central planning and not on economic rationale. It was mirrored in production infrastructure, distribution infrastructure and the structure of interrepublican trade. These structural factors are sticky. It is not simple to change this pattern in the short run. Bilateral balancing may have caused unnecessary abrupt disruptions in this pattern and the consequences may have been rather serious given the larger stickiness.

18. Kazakhstan produces crude oil and also operates refineries. These refineries were situated close to the Russian border and traditionally refined Russian oil, while its own oil was refined somewhere else. This was a structural dependence because there were pipelines to bring the Russian crude to the Kazakh refineries, but not from the domestic oil production to the domestic refineries. So the refineries could not switch to domestic oil in the short run, while the breakdown of interrepublican trade urged Russian oil producers to export their oil to other destinations. As a result, the Kazakh refineries stood idle. In this example the Kazakh refineries are the main losers. There are however plenty examples where both parties got hurt. The cotton producers in Uzbekistan and the Russian textile industry were for example mutually dependent and the breakdown of trade meant a major blow for both.

19. Tarr (1994) uses Goskomstat data for 1989 and 1990 and finds that the winners of this shift in the terms of trade would be Russia, Turkmenistan and Kazakhstan, while the biggest losers were estimated to be the Baltic states, Belarus and Moldova. His findings support the idea that raw material and energy exporters would gain at the expense of machinery builders and other sectors. This was to be expected given the distortion of relative prices due to central planning.

20. We used trade data of Goskomstat for 1987 and the first quarter of 1993, when the crisis of interrepublican payments fully arose. We calculated for every republic (interrepublican exports - interrepublican imports)/((interrepublican exports+ interrepublican imports)/2), which is the interrepublican trade balance as a proportion of interrepublican trade. We regressed 1993-data on 1987-data and included a dummy for Tajikistan, which was in civil war at the time. We found 1%-significance and an adjusted R^2 of more than 80%. This supports the idea that the 1987 trade structure was still quite representative for 1993.

21. The weights were:

Ukraine	58,2%
Belarus	17,5%
Uzbekistan	0,0%
Kazakhstan	11,9%
Georgia	3,3%
Azerbaijan	0,0%
Moldova	3,2%
Kyrgyzstan	2,2%
Tajikistan	1,6%
Armenia	2,2%
Turkmenistan	0,0%
Total	100,0%

The surplus countries were -next to Russia- Uzbekistan, Azerbaijan and Turkmenistan.

22. These were in alphabetical order Austria, the Belgian-Luxemburg Economic Union, Denmark, Germany, Greece, France, Iceland, Ireland, Italy, the Netherlands, Norway, Portugal, Sweden, Switzerland, Turkey and the United Kingdom (Kaplan and Schleiminger, 1989)

23. It is widely accepted that 1,3 x NMP is comparable to GNP.

24. Recently full convertibility has been established in both countries and the payment system has been abolished.

25. Advisory Group on Interstate Economic Relations of the European Expertise Service (EES-AGIR), financed by the TACIS-programme of the EU.

26. At that moment only the Baltic countries had independent currencies. The other countries had often cash substitutes in the form of coupons, but retained the ruble as legal tender and remained in the ruble zone.

27. Decision of the heads of state of the CIS, 9 October 1992, issued at the summit of the heads of state of the CIS, Bishkek, October 1992.

28. Naming a clearing institution the 'Interstate Bank' (ISB) may seem strange but after all the same happened with the EPU, where the central clearing institution was named the 'Bank for International Settlements' (BIS). The banking functions of the BIS were initially also limited to the granting of technical credits, within the limits provided by the EPU.

29. The first president of the ISB was Mr. Solovov, vice-president of the CBR. During the negotiations on the charter, it became clear to us that Mr. Solovov was clearly not convinced of the use of the ISB for Russia. Having him as a president was a clear sign that the ISB would not be operational in the short run.

30. See Kommersant, No. 8, 22-28 February 1993 and No. 46, 15-21 November 1993, p. 22.

31. Kommersant-Daily repeatedly published quotations of these exchange rates

32. See CBR, 1994 in various issues of its publication 'Tekushie Tendentsii v Denezhno-Kreditnoi Sfere'

Chapter V. Bank assets

0. Overview

In this chapter we turn our attention to the asset side of Russian commercial banks. The chapter is organized as follows. The next section investigates the role of required reserves. Were required reserves constraining liquidity of banks ? Section 2 turns to the paradox of excess reserves and explains why Russian banks were holding an impressive volume of excess reserves in early transition. Section 3 adds to this the role of treasury bonds. Section 4 gives attention to bank loans. Section 5 analyses the interbank market. Several conclusions can be drawn from the analysis :

- Required reserves are enforced only gradually.
- Required reserves have decreased inflation.
- Nevertheless, there are indications that required reserves also served the goals of implicit taxation and implicit deposit insurance.
- Excess reserves are to a large extent due to payment problems.
- However, the hypothesis of excess liquidity cannot be rejected.
- Excess reserves are also due to the interest elasticity of loan demand and high loan rates.
- Treasury bills provided banks with a substitute for excess reserves, which indicates once more the role of excess reserves as an indicator as excess liquidity.
- The Russian loan market combines perverse credit rationing with the adverse selection properties of high loan rates.
- Loan rates are set as a mark-up to costs.
- Higher competition increases loan rates.
- The softness of state banks is not in lower loan rates but in higher access to credit for their clients. As a matter of fact state banks have higher than average loan rates and lower than average loan quality.
- Loan rates have adverse selection properties.
- A theoretical model that jointly defines excess reserves, loan quality and loan demand as a function of the loan rate is proposed.
- Estimations show that this simple model can explain reality very well.

1. Required reserves

1.1. The nature of required reserves

Required reserves are funds which banks have to deposit on their account at the central bank. Usually they are defined as a proportion of certain classes of liabilities, mostly deposits. Required reserves are a traditional instrument of monetary policy. Central banks that apply requirements claim to pursue two goals, namely to secure the bank sector against systemic risk and to conduct monetary policy. There exist however better instruments to achieve these goals. Systemic risk is better contained by good prudential control and supervision and properly priced deposit insurance. With respect to monetary policy Kantas and Greenbaum (1982) have sufficiently shown that monetary policy is better off with deliberate and interest earning reserves at the central bank than with obligatory reserves that earn no or low interest. Galbraith and Rymes (1993) have shown that the central bank can better conduct its monetary policy by

properly setting overdraft rates in its function as clearing centre in the payments system. Required reserves often pay interest rates below the market rate (sometimes even zero). This characteristic cannot be motivated from the point of view of systemic risk or the conduct of monetary policy and therefore reveals the true nature of these requirements. If this is the case, then the required reserves are primarily an instrument of financial repression (see McKinnon and Mathieson, 1981) and offer a cheap source of financing for the state budget (through central bank credits or dividends of the central bank to the budget). For these reasons reserve requirements have fallen from grace of the central banks of OECD countries. They have gradually been replaced by market-based instruments. However, since in most transition countries financial markets are weakly developed, alternative instruments are not readily available. Therefore reserve requirements play an important role in the monetary policy of transition countries. Especially transition countries with budgetary problems have relied heavily on required reserves to finance deficits. Konopielko (1997) estimated the implicit tax revenue for the government from reserve requirements in Hungary, Poland and the Czech Republic. Using the opportunity cost definition[1], he finds that the implicit tax revenue was on average 0.62% of GDP for Poland in the period 1992-1994, 0.59% of GDP for Hungary in 1990-1994 and around 0.4% for the Czech Republic in 1992-1993. Given the low development of the financial markets in these countries these estimates are comparable with those for Italy (Molho, 1992) and Spain and Portugal (Repullo, 1991), before the convergence criteria of Maastricht.

1.2. Required reserves in Russia

It is not surprising that Russia, with its huge budget deficits and its underdeveloped financial markets, also applied reserve requirements. The Russian regime of required reserves changed frequently during 1991-1995[2]. Before 1992, required reserves were 2% of deposits. At the beginning of reforms in early 1992, the requirement was strengthened to 15% on short term deposits and 10% on long term deposits.

The most important document for the current regulatory framework is the letter from the CBR of 15 February 1994 (No. 13-1/190) and its adaptations of 31 December 1994 (No. 135) and of 29 March 1995 (No. 158). Androsov (1995) gives an overview of the procedures that are in effect since March 1994 and the various adaptations. We summarise that banks are due to the central bank 20 % on short term ruble deposits and 15 % on long time ruble deposits. Deposits have to be interpreted broadly as sources of funds. Some sources of funds are excluded. Logically there are no required reserves due on credits from the central bank, debts to personnel, debts to the budget and due interest payments. Interestingly, bonds, interbank credits and currency deposits are also exempted from required reservation. The required reserves have to be deposited by banks at a special account with the CBR, where the funds are frozen. Required reserves are booked on the banks' balance accounts Nos. 816 and 681, which is mirrored on the balance of the CBR by accounts Nos. 815 and 680. If a bank fails to comply with this regulation the CBR can sanction it. Last but not least, required reserves bear no interest (article 12). Note also that Sberbank is exempted from reserve requirements.

1.3. What do we see de facto ?

Table V.1. Are required reserves really required ?

	Required reserves (1)	Ruble deposits (2)	Ratio (1)/(2)
Dec91	8	831	1.0%
1992			
Jan92	12	827	1.5%
Feb92	35	1007	3.5%
Mar92	86	1075	8.0%
Apr92	92	1131	8.1%
May92	94	1189	7.9%
Jun92	114	1488	7.6%
Jul92	147	1951	7.5%
Aug92	185	2592	7.1%
Sep92	254	35.16	7.2%
Oct92	346	4526	7.6%
Nov92	421	4589	9.2%
Dec92	472	4372	10.8%
1993			
Jan93	569	5285	10.8%
Feb93	639	5503	11.6%
Mar93	731	6354	11.5%
Apr93	891	7754	11.5%
May93	1067	9440	11.3%
Jun93	1227	10652	11.5%
Jul93	1389	12167	11.4%
Aug93	1615	13814	11.7%
Sep93	1895	13362	14.2%
Oct93	2145	14728	14.6%
Nov93	2427	15836	15.3%
Dec93	2710	18496	14.6%
1994			
Jan94	3145	20383	15.4%
Feb94	3303	21209	15.6%
Mar94	3603	22883	15.7%
Apr94	4027	26501	15.2%
May94	4599	31034	14.8%
Jun94	5431	34685	15.7%
Jul94	6290	36249	17.4%
Aug94	7071	41459	17.1%
Sep94	8119	44804	18.1%
Oct94	8765	50930	17.2%
Dec94	9863	56208	17.5%

Source: Granville (1995)

Under the weak assumption that less than 10% of deposits was long term, the average reserve requirement was about 14.5% of total ruble deposits from early 1992 until the end of February 1994 and about 19.5% of total deposits since. However, the data in table V.1. tell another story. Table V.1. shows total ruble deposits, required reserves and their ratio. We see that the

legally imposed 14.5% was first reached in October 1993 (14.6%), about two years after its implementation in early 1992. The 19.5% imposed in March 1994 was still not reached in practice by end 1994, though the difference was getting small in the last quarter of 1994. We conclude that required reserves are enforced only gradually by the CBR.

What may explain the difference between the legal requirement and actual required reserves ? The culprit may be fraud and miscalculation in the calculation of required reserves. The IMF (1995) explains how the concrete calculation methods created room for abuse. By shifting deposits among each other in a timely matter banks could easily abuse the calculation method to get a lower reserve requirement. Only in 1995 these calculation methods were altered. We accept this hypothesis of fraud and miscalculation. Also the CBR must have been physically unable to control the weekly reports of the more than 2500 banks that existed in 1994. In addition to these factors we believe that the CBR deliberately chose not to enforce requirements because the CBR had other goals than merely monetary policy.

1.4. The hidden agenda of the CBR

We pointed out that required reserves may not have been enforced because the CBR may have had multiple goals, other than monetary policy. What were these alternative goals ?

One alternative policy goal may be **deposit insurance.** The Russian banking system is young and fragile because of its weak and fragmented deposit base (see chapter III) and its lack of diversification. The CBR, being responsible for the stable development of the commercial banking system, may want to prevent bank runs and an eventual system-wide crisis by means of deposit insurance. An explicit deposit insurance system was absent, but the required reserves may have functioned as an implicit deposit insurance mechanism. Indeed, required reserves were widely conceived as a deposit insurance vehicle by high central bank officers. Ms Paramonova, the former president of the CBR, said explicitly that to her opinion required reserves had served two purposes, namely monetary policy and deposit insurance[3]. The CBR thus motivated the need for required reserves among others by the need for deposit insurance. The empirical question is whether we can reject the hypothesis that de facto required reserves were driven by deposit insurance principles. These principles could for example be credit risk or the riskiness of the bank in general.

Table V.2. Destination of CBR-credits

	commercial banks	CIS	budget	enterprises
Q1 92	56.9%	11.3%	28.2%	3.6%
Q2 92	40.1%	23.7%	34.3%	1.8%
Q3 92	34.5%	31.5%	33.2%	0.7%
Q4 92	38.6%	23.0%	37.8%	0.5%
Q1 93	37.0%	24.0%	38.4%	0.6%
Q2 93	37.0%	23.7%	38.7%	0.7%
Q3 93	39.2%	20.5%	39.7%	0.6%
Q4 93	35.5%	16.3%	47.6%	0.6%
Q1 94	29.3%	12.3%	57.7%	0.7%
Q2 94	27.7%	9.2%	62.4%	0.7%
Source : Russian Economic Trends, various issues				

A second alternative policy goal may have been implicit **taxation.** Off course, required reserves that bear below market interest rates yield inflation tax by definition. This is not what we have in mind. We put forward that the CBR amplified this inflation tax effect by enforcing the requirements more strictly on profitable banks than on less profitable banks. We believe that at least some factions in the CBR conceived the high bank profits in early reform as speculative and unjust and considered the required reserves as an instrument to redistribute financial resources to allocations favoured by the CBR, for example (former) state enterprises with the appropriate connections. Looking at the balances of the central bank (see table V.2.), we observe that CBR-credits are destined mainly to the state budget, the former republics (CIS) and banks. The large credits to commercial banks to a large extent mask directed credits to enterprises through commercial banks (see chapter III). The credits to former republics were used to finance interrepublican trade and often amounted to an indirect subsidy to Russian exporters (see chapter IV). The budget deficit was caused to a large extent by continued subsidies to enterprises, often disguised as tax arrears. So, while in table V.2. enterprises appear to be only a minor beneficiary of CBR-credits, they may in reality be the main beneficiary.

If we are right, then de facto required reserves must be correlated with the profitability of commercial banks. One could say that this only proves that more profitable banks deliberately chose to hold more required reserves than less profitable colleagues and not that the central bank required them to do so. But why would one deliberately hold more required reserves (that are frozen) than the CBR requires, if one can also hold them as excess reserves and gain the liquidity of the funds concerned. Our later finding that excess reserves are driven by reserved profitability (see section 2.) seems to support this argument.

1.5. Empirical analysis

1.5.1. The monetary policy purpose

1.5.1.1 General

We try to find a monetary explanation for Russian inflation in the observation period and then use the findings to analyse the role of required reserves. It is a common empirical finding that inflation is well explained by monetary aggregates (M2) in the long run. Tests on the quantity theory of money have been performed among others by Vogel (1973), Friedman and Schwarz (1974), Lothian (1985) and Duck (1993) in high inflation economies. The theory seems to work pretty well in the short run too. This is for example the case in Russia, where several authors have found that money growth explains very well inflation three to four months ahead (see for example Sachs; 1993, Vieira da Cunha and Easterly, 1993; Fisher, 1994; Koen and Marrese, 1995; Granville, 1995; Hoggarth; 1996; a.o.).

We adopt a slightly different approach, suggested by the specific Russian monetary system. Cash and non-cash were not perfect substitutes in Russia in 1992-1994. Wages were still mainly paid in cash, while most non-cash ruble transfers were effected by enterprises. This means concretely that cash is transmitted rapidly into consumer prices via consumption of paid wages. Later, the effect of cash on inflation may be recycled through ruble deposits. In general a growth of ruble deposits is transferred into consumer prices differently and slower[4]. The

problem with the use of M2 as a regressor is the consequent impossibility to incorporate the effects of the different transmission mechanisms of cash and deposits, because M2 is the sum of both. There is an analogous problem with the use of M0. M0 contains cash issued and required reserves of commercial banks[5]. We however expect cash and required reserves to have an opposite effect on inflation, so it makes no sense to use their sum as a regressor. We think that this awkward use of M0 and M2 in the calculation of velocity is one of the culprits for the observed instability of velocity in high inflation economies. Therefore we will not use M2 or M0 but instead concentrate on their substituents, namely cash issued, ruble deposits and required reserves.

1.5.1.2. Data, variables and methodology

We use monthly data on consumer price inflation, required reserves held de facto, cash issued and ruble deposits for the Russian federation, for the period January 1992-December 1994. These data are originally from the monthly bulletin of the CBR, but taken from Granville (1995).

The dependent variable is monthly consumer price inflation (DCPI).

The independent variables were constructed as follows :

RR	=	required reserves,
CASH	=	cash in circulation,
RUBDEP	=	ruble deposits with Russian commercial banks,
CPI	=	consumer price index,
BREAK1	=	dummy variable, 1 for months after November 1993 and 0 for all other months.

BREAK1 indicates the stabilisation of financial markets and politics that took place end 1993. The refinance rate became positive in real terms in December 1993 and the political situation stabilised after the turmoil in September 1993 and the elections in December 1993.

Then we calculate moving averages for cash in circulation and ruble deposits:

$$AVG3CASH = (CASH_{t-1} + CASH_t + CASH_{t+1})/3$$
$$AVG3RUBDEP = (RUBDEP_{t-1} + RUBDEP_t + RUBDEP_{t+1})/3$$

Then we calculate growth rates :

$$DAVG3CASH = (AVG3CASH_t - AVG3CASH_{t-1}) / AVG3CASH_{t-1}$$
$$= (CASH_{t+1} - CASH_{t-2}) / (CASH_t + CASH_{t-1} + CASH_{t-2})$$
$$DAVG3RUBDEP = (AVG3RUBDEP_t - AVG3RUBDEP_{t-1})/(AVG3RUBDEP_{t-1}) \qquad (5.1.)$$
$$= (RUBDEP_{t+1} - RUBDEP_{t-2}) / (RUBDEP_t + RUDEP_{t-1} + RUBDEP_{t-2})$$
$$DRR = (RR_t - RR_{t-1})/RR_{t-1}$$

We perform an OLS of DCPI (monthly inflation) on combinations of the variables calculated according to (5.1). We expect that the lag for growth in ruble deposits will be longer than the lag for growth in cash and that the lag for required reserves will be even higher, since the effect of required reserves is transmitted through banks credits, quite like deposit money. The coefficient of RR is expected to be negative. Panel a of table V.3. shows the estimates without RR.

In equation 1 we regress inflation on DAVG3CASH (3 periods lagged), and DAVG3RUBDEP (5 periods lagged), following our intuition about different transmission mechanisms for cash and non cash. In equation 2 we introduce BREAK2, which measures stabilisation. We expect that after stabilisation the willingness of consumers to hold cash will have increased. For data points after BREAK2 we therefore expect a lower coefficient and a higher time lag for DAVG3CASH. In equation 3 we rewrite ruble deposits in function of cash issued in the previous period. Changes in ruble deposits are logically driven by lagged changes in cash. Therefore cash has also an indirect effect on inflation through the money multiplier process. In panel b of table V.3., we added RR (6 months lagged) to all equations.

1.5.1.3. Presentation of results and interpretation

Table V.3. The effect of required reserves on inflation (including required reserves)

Independent variable : DCPI			
No. of observations	29	28	28
Equation No.	1	2	3
Panel a			
DAVG3CASH(-3)	0.564 ***		
	(5.14; 0.000)		
(I-BREAK2)*DAVG3CASH(-3)		0.624 ***	0.53 ***
		(6.11; 0.000)	(3.565; 0.000)
BREAK2*DAVG3CASH(-4)		0.415 ***	0.293
		(3.13; 0.004)	(1.09; 0.288)
DAVG3RUBDEP(-5)	0.485 ***	0.459 ***	
	(3.63; 0.001)	(3.73; 0.000)	
DAVG3CASH(-6)			0.482 ***
			(3.29; 0.003)
Adjusted R²	0.604	0.681	0.722
DW	0.906	0.935	1.283
Panel b			
DAVG3CASH(-3)	0.723***		
	(6.18; 0.000)		
(I-BREAK2)*DAVG3CASH(-3)		0.826 ***	0.650 ***
		(8.37; 0.000)	(5.17; 0.000
BREAK2*DAVG3CASH(-4)		0.566 ***	0.293 *
		(4.93; 0.000)	(1.87; 0.074)
DAVG3RUBDEP(-5)	0.399 ***	0.352 ***	
	(3.17; 0.004)	(3.39; 0.002)	
DAVG3CASH(-6)			0.497 ***
			(4.14; 0.000)
DRR (-6)	-0.058 **	-0.071***	-0.102 ***
	(-2.59; 0.015)	(-3.78; 0.001)	(-3.66; 0.001)
Adjusted R²	0.661	0.773	0.80
DW	0.857	0.920	0.947

White heteroskedasticity-consistent standard errors & covariance
For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.
T-statistics and t-probability are in brackets.

Interpretation

Russian inflation can largely be explained by variations in cash emission, growth of ruble deposits and growth of required reserves. The lag structures and coefficients found do not reject our idea of differences in transmission mechanisms of cash and non-cash money. The components of monetary aggregates under observation are all significant and adjusted R^2 is fairly high for such a simple monetary specification.

The coefficient for RR is significant and negative, as predicted. Without required reserves (table V.3., panel a) the explanatory power of all equations is lower and the coefficient for cash emission is also lower. The values of the coefficients show that the effect on inflation of the two monetary policy instruments (cash emission and required reserves) differ largely. A rise in required reserves with 1% is followed by a 0.058% decrease of prices six months later, while an increase of 1 % of cash in circulation raises prices directly with about 0.72% on average three months later (equation No. 1 in panel b). Introducing BREAK2 and the indirect effect of cash emission via ruble deposits (equations 2-3) complicates the interpretation but does not alter the conclusion. Required reserves have tempered inflation significantly. However, their effect was only to mitigate the strong inflationary effect of cash emission. Hence monetary policy was not very consistent in 1992-1994. There are many indications that monetary policy was not strict in 1992-1994[6]. Some more indications of softness were identified in chapter III and IV and others will be identified in this chapter.

Note that there is a problem with serial correlation in the residuals (low DW-statistic). This may be due to specification problems. We performed this analysis following the examples of Sachs (1994), Vieira da Cunha and Easterly (1994), Koen and Marrese (1995), Granville (1995), Hoggarth (1996) a.o. None of these authors seems to mind that the variables are not stationary, as shown in table V.4. This may cause spurious regression (Granger and Newbold, 1974) which explains the serial correlation in the residuals. In table V.4. we show that the residuals of equation No. 1 in table V.3. are indeed not I(0). Therefore the model is meaningless.

This is why we repeated the analysis with the first differences of the variables (see Enders, 1995, p. 219), which are all stationary (see table V.4.). To keep things simple we abandoned the dummies and regressed d(DCPI) on d(DAVG3CASH) d(DAVGRUBDEP) and d(DRR). DAVG3RUBDEP was insignificant and was replaced by d(RUBDEP). We again varied the lag structures within the constraint of our hypothesis of different transmission mechanisms. The result is reported in table V.5. Again our hypotheses are supported by the data and this time there is no problem with serial correlation of the residuals, while adjusted R^2 remains reasonably high. All variables are significant and show the expected sign. The lag structure does not reject the hypothesis of different transmission mechanisms. Note that the significance of required reserves is high.

The significance of required reserves across specifications strongly suggests that the approach to use M0 as an explanatory variable for inflation in other studies is deficient, because it fails to recognise the opposite effects of cash issued and required reserves. In stable economies this deficiency is not important because of the stable relation between required reserves and cash. In high inflation economies such as Russia it is important, and should be taken into account.

Table V.4. Stationarity of the variables

	Augmented Dickey-Fuller			Phillips-Perron		
	Test statistic	critical values		Test statistic	critical values	
DAVG3CASH	-0.654792	1%	-3.6661	-0.827640	1%	-3.6576
		5%	-2.9627		5%	-2.9591
		10%	-2.6200		10%	-2.6181
d(DAVG3CASH)	-3.094853	1%	-3.6752	-6.020159	1%	3-3.6661
		5%	-2.9665		5%	-2.9627
		10%	-2.6220		10%	-2.6200
DAVG3RUBDEP	-4.117530	1%	-3.6661	-2.402235	1%	-3.6576
		5%	-2.9627		5%	-2.9591
		10%	-2.6200		10%	-2.6181
DRUBDEP	-3.307008	1%	-3.6496	-3.447906	1%	-3.6496
		5%	-2.9558		5%	-2.9558
		10%	-2.6164		10%	-2.6164
d (DRUBDEP)	-4.939728	1%	-3.6576	-7.088430	1%	-3.6496
		5%	-2.9591		5%	-2.9558
		10%	-2.6181		10%	-2.6164
DRR	-17.29690	1%	-3.6576	-11.84221	1%	-3.6576
		5%	-2.9591		5%	-2.9591
		10%	-2.6181		10%	-2.6181
DCPI	-1.881387	1%	-3.6422	-1.983788	1%	-3.6422
		5%	-2.9527		5%	-2.9527
		10%	-2.6148		10%	-2.6148
d(DCPI)	-5.766033	1%	-3.6422	-6.129251	1%	-3.6422
		5%	-2.9527		5%	-2.9527
		10%	-2.6148		10%	-2.6148
residuals of equation 1 table V.3. , panel b	-1.554625	1%	-3.6959	-2.004625	1%	-3.6852
		5%	-2.9750		5%	-2.9705
		10%	-2.6265		10%	-2.6242

Table V.5. The effect of required reserves on inflation without spurious regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DAVG3CASH(-2))	0.318863*	0.173517	1.837652	0.0797
D(DRUBDEP(-6))	0.102006***	0.034149	2.987100	0.0068
D(DRR(-6))	-0.136416***	0.007829	-17.42477	0.0000
	Variance Equation			
C	0.000100	0.000133	0.755057	0.4582
ARCH(1)	-0.093456	0.146082	-0.639750	0.5289
GARCH(1)	0.968088	0.302396	3.201389	0.0041
R^2	0.654808			
F-statistic	8.346544			
Durbin-Watson stat	1.757864			

Bollerslev-Wooldrige robust standard errors & covariance (ARCH-correction for possible heteroskedasticity)
For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.

1.5.2. Are some banks more equal than others ?

1.5.2.1. Methodology, data and variables

The fact that required reserves are not strictly enforced for the whole banking sector is worrying. We hypothesized it is because the CBR has alternative goals on its hidden agenda, namely supplying deposit insurance and extracting inflation tax. If this is the case, then required reserves are enforced in a different way for different banks, depending on their characteristics. To explore this hypothesis we apply a bank-based analysis. Using bank account data we try to determine which factor de facto drove required reserves of banks. The most important driver of required reserves (RR) should be the **legally imposed driver**, namely deposits on which requirements are formally due (RRDEP). Our hypothesis is that profitability and credit risk are also drivers. **Profitability** can be measured in two ways, namely current profitability (POA) and accumulated profitability (RES). We expect that initially POA is more meaningful than RES, because 1992 is the year zero for an important number of Russian commercial banks. There was not much to reserve before 1992. RES is expected to become significant only later on. We use several measures of **credit risk**. Theoretically the best measure would be the proportion of bad loans in total assets (BL). However, most Russian banks had no clear and consistent accounting procedures with respect to overdue credits in 1992-1993. The information recorded in the accounts may for obvious reasons be inconsistent and unreliable. In fact for 1992 all 45 banks reported 0 overdue credits, one bank excluded. In 1993 banks started to report BL. Still some banks reported zero BL for 1993, which was obviously a misrepresentation of the real situation. Only by end 1994 there existed a consistent legal framework that regulated reporting of overdue credits (see Androsov, 1995). We propose some other measures of credit risk (TL1 and TL2) that are very rough. TL1 and TL2 measure the scale of the loan portfolio. Using them as a measure for credit risk, implies the assumption that credit risk was driven by systemic problems. TL1 and TL2 are an appropriate measure for credit risk only if the bank cannot avoid credit risk by better monitoring and screening.

We use sample A(1992), A(1993) and A(1994). The method used is OLS.

The dependent variable is required reserves :
RR   = required reserves / total assets

The independent variables are :
- legally imposed driver
  RRDEP   = deposits on which required reserves are due / total assets
- profitability
  POA   = current profit / total assets
  RES   = reserves / total assets
- credit risk
  BL   = overdue loans / total assets
  TL1   = total loans / total assets
  TL2   = total loans (interbank loans included) / total assets

1.5.2.2. Presentation of results and interpretation

Table V.6. Required reserves in 1992

Dependent variable: RR end 1992				
Included observations: 44				
No.	1	2	3	4
-RRDEP	0.112 ***	0.112 ***	0.119 ***	0.119 ***
	(8.14; 0.000)	(7.26; 0.000)	(7.162; 0.000)	(7.542; 0. 000)
Profitability				
-POA	0.539 ***	0.533 ***		
	(4.49; 0.000)	(4.58; 0.000)		
-RES			2.591 ***	2.603 ***
			(3.48; 0.001)	(3.45; 0.001)
Credit risk				
-TL1	-0.018 **			0.0049
	(-2.379; 0.022)			(0.436; 0.665)
-TL2		-0.016 *	0.0044	
		(-1.707; 0.096)	(0.356; 0.723)	
Adjusted R^2	0.688	0.684	0.596	0.596
F-statistic	48.553	47.522	32.748	32.809

White heteroskedasticity-consistent standard errors & covariance
For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.
T-statistics and t-probability are in brackets.

Table V.7. Required reserves in 1993

Dependent variable: RR end 1993				
Included observations: 60				
No.	1	2	3	4
-RRDEP	0.14 ***	0.135 ***	0.162 ***	0.161 ***
	(13.98; 0.000)	(10.52; 0.000)	(13.92; 0.000)	(10.285; 0 000)
Profitability				
-POA		0.057		0.054
		(1.44; 0.156)		(1.207; 0.23)
-RESASS	0.577 **		0.575 **	
	(2.596; 0.012)		(2.24; 0.028)	
Credit risk				
-BL	0.208 **	0.218 **		
	(2.646; 0. 011)	(3.558; 0.013)		
-TL2			-0.006	-0.007
			(-1.029; 0.307)	(-1.157; 0.252)
Adjusted R^2	0.683	0.661	0.642	0.618
F-statistic	64.684	58.628	53.946	48.732

White heteroskedasticity-consistent standard errors & covariance
For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.
T-statistics and t-probability are in brackets.

Table V.8. Required reserves in 1994

Dependent variable: RR end 1994				
Included observations: 126				
No.	1	2	3	4
-RRDEP	0.152 ***	0.155 ***	0.15 ***	0.147 ***
	(15.82; 0.000)	(17.60; 0.000)	(16.915; 0.000)	(14.815; 0.000)
Profitability				
-POA			0.055 **	0.0625 **
			(2.001; 0.048)	(2.259; 0.026)
-RES	0.542 **	0.478 **		
	(2.546; 0.012)	(2.215; 0.029)		
Credit risk				
-TL1	0.019 ***			0.022 ***
	(2.844; 0.005)			(3.32; 0.001)
-TL2		0.016 ***	0.018 ***	
		(3.094; 0.002)	(3.602; 0.001)	
Adjusted R²	0.641	0.642	0.641	0.639
F-probability	112.698	113.31	112.72	111.625

White heteroskedasticity-consistent standard errors & covariance
For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.
T-statistics and t-probability are in brackets.

Interpretation of results

The coefficient for RRDEP was between 11% and 12% in 1992 (see table V.4), between 13% and 14% in 1993 (see equations No. 1 and 2 in table V.7.) and between 14.7% and 15.5% in 1994 (see table V.8.). This strongly supports the idea that requirements are enforced not abruptly but rather gradually.

Given the significance of all our profitability measures in most equations (equation No. 2 and 4 of table V.7. excluded) the inflation tax hypothesis cannot be rejected. The fact that both POA and RES work well, is comforting. Note that the coefficients for RES and POA are decreasing substantially from 1992 to 1994. The coefficient for RES decreases from an extortionate 2.6 in 1992 to 0.57 in 1993 and about 0.5 in 1994. The coefficient for POA falls from a 1992 high of about 0.53, to 0.057 in 1993 and 0.055 in 1994. Implicit taxation of excess profit was significant throughout 1992 but coefficients (and hence the implicit tax) are decreasing.

The deposit insurance hypothesis is strongly rejected for 1992. Coefficients were insignificant or even showed the wrong sign (see equation No. 1 and 2 in table V.8.). In 1993 the BL is a significant explanatory variable for required reserves (see equation No. 1 and 2 in table V.7.), which supports the credit risk hypothesis. The significance of BL crumbles in 1994 (not reported in table V.8.) and TL1 and TL2 become significant instead. This time they also show the right sign. The deposit insurance hypothesis can therefore not be rejected for 1993-1994. Note also that the coefficients for TL1 and TL2 are fairly low (about 0.02 in 1994), which fits well the insurance argument.

The insignificance of BL in 1994 may have a simple explanation. In 1992 no bank reported overdue assets, so BL could not be calculated. In 1993 some banks started to report overdue loans, but some did not. Coming from an equilibrium where nobody admits bad loans, the mere fact of reporting may have had a signalling effect to the CBR. In 1994 almost every bank had started to report its overdue loans. Therefore the signalling effect of BL may have crumbled to the benefit of more general measures of credit risk such as TL1 or TL2.

Last we want to stress that our conclusions should be handled with care. Taxation of excess profits nor deposit insurance are proven by this analysis. That can only be done by interviewing the 1992-1994 CBR personnel. We only show that the hypothesis is at least not rejected by bank data.

2. Excess reserves

Excess reserves are reserves voluntarily held by commercial banks on their correspondent accounts at the CBR. These reserves bear also zero interest rates but are at the banks' free disposal. They should be a good indicator of the liquidity of banks.

2.1. The paradox

Table V.9 shows data on required, voluntary and total reserves. Notwithstanding the apparent repression of banks by high required reserves, banks voluntarily held substantial excess reserves with the central bank. Excess reserves reached extremely high levels. They were four to five times higher than required reserves in 1992 and two to four times higher in 1993. Only at the end of 1994, excess reserves reached levels that are comparable with those of required reserves. Still, this is remarkably high. It seems as if commercial banks were not liquidity constrained at all by required reserves. This leaves us with a paradox.

Table V.9. Excess reserves and required reserves compared

	Excess Reserves (1)	Ruble Ratio deposits (2)	Ratio (ER/RD) (1)/(2)	(RR/RD) see table V.1.
Q1/92	306	1075	20.5%	8.0%
Q2/92	705.5	1488	39.8%	7.6%
Q3/92	1634	3561	39.2%	7.2%
Q4/92	2521.9	4372	46.9%	10.8%
Q1/93	2790.4	6354	43.9%	11.5%
Q2/93	2716.9	10652	25.5%	11.5%
Q3/93	4114.3	13362	30.8%	14.2%
Q4/93	5751	18496	31.1%	14.6%
Q1/94	6626	22883	29%	15.7%
Q2/94	7748	34685	22.3%	15.7%
Q3/94	10139	44804	22.6%	18.1%
Q4/94	10100	56208	18.0%	17.5%
Source: Granville (1995)				

2.2. Theoretical arguments to resolve the paradox

In the literature we find a number of contributions that explain the paradox. Several arguments have been put forward, namely data problems, credit risk, payment system problems, absence of alternatives and excess liquidity.

Sunderarajan and Sensenbrenner (1994) find that centralised credit resources were channelled to enterprises via the banks' correspondent accounts at the CBR. Due to the slow settlement system this artificially inflates the banks' correspondent accounts which are used to measure their reserves at the CBR (see chapter IV). Sensenbrenner and Sunderarajan (1994) offer data series to correct this distortion. However, after their corrections there still remains an impressive amount of excess reserves.

The credit risk argument is less straightforward. Why would banks prefer to voluntarily hold excess reserves and pay the price in the form of inflation tax? Berglöf and Roland (1995) give a theoretical answer. They build a model with systemic credit risk. They show that, in an environment of severe loan losses and bad quality of loans, banks prefer to accumulate reserves rather than grant new credits. We will give an alternative interpretation of their theory in section 4.4. Granville (1995) also mentions the importance of credit risk. Using a simple model she shows that with no credit risk and profit-maximising banks, excess reserves would be set in such a way that banks would fall short of liquidity and use the overdraft facility of the CBR on three days out of four. In practice however, one observes that banks made very limited use of the overdraft facility. To realign this observation with the model of Granville, one needs to introduce a substantial amount of credit risk.

Payment system inefficiencies (see below) are another factor. Baliño, Dhawan and Sunderarajan (1994) explain why. One typical consequence of the inefficient payment system in Russia in 1992-1994 is the large size and variability of payment float[7]. Large and unpredictable flows of payment float impede effective liquidity management by commercial banks and force commercial banks to hold large levels of excess reserves as a buffer against the variability of float. If payment float is large and unpredictable, so will be bank reserves, because of the inability of banks to manage their liquidity more efficiently in such a situation.

Granville (1995) rightly points out that banks had no alternative in the form of domestic interest-bearing reserves. Treasury bills were introduced only in May 1993, and they became broadly accepted only in 1994. Moreover the auctions were initially held only in Moscow, and thus available only to Moscow banks. Gradually the CBR also started to hold regional auctions. Adding the stock of treasury bills to the stock of excess reserves, we observe that the relation between required reserves and excess reserves stays roughly constant. So the unavailability of interest-bearing reserves urged banks to involuntarily hold excess reserves at the central bank for the purpose of liquidity management (see section 3).

Another straightforward explanation, that however has not been put forward in the literature, is the interest elasticity of loan demand. Combined with the lack of alternatives put forward by Granville (1995), high loan rates would logically decrease loans granted and hence increase the level of excess reserves. This conjecture is studied in detail in section 4.4. of this chapter.

Last, it is possible that in 1992-1994 banks were not liquidity constrained by required reserves. This fits the credit risk hypothesis of Berglöf and Roland (1995). Maybe banks were liquid because they did not grant credits and preferred to accumulate reserves instead. Khoo and Tsepliaeva (1994) were the first to test a number of explanations. They did not find statistical significance and attributed the excess reserves to the slowness of the money creation process.

2.3. Empirical analysis

2.3.1. Data, variables and methodology

We adopt a bank-based empirical approach and sample A(1994) to explore the various determinants of excess reserves on the level of a single bank. We know from Sunderarajan and Sensenbrenner (1994) that excess reserve data were distorted by the settlement of centralised credit resources. However, we cannot use Sunderarajan and Sensenbrenner's general corrections for our bank-based approach. Therefore we concentrate on 1994-data. This largely solves the measurement problem because at that time centralised credit resources were reduced to fairly small flows.

Variables

The dependent variable (ER) is defined as excess reserves, divided by total assets.

The independent variables follow from the theory above.

To approximate the **flow of payments** we divide the current accounts of enterprises by total assets (CATA). We suspect that the amount of money on current accounts of enterprises is a good indicator for the flow of payments handled by the bank. We expect a positive sign. Unfortunately we do not have any better bank data on the flow of payments.

For **credit risk** we use TL2, which worked best for measuring credit risk in section 2 (see table V.8.). The coefficient is expected to be positive.

For **liquidity** we need an indirect measure. Every direct measure would involve excess reserves, which is the independent variable. Therefore we use asset profitability (POA), which should be a good proxy for liquidity. The coefficient is expected to be positive.

The capability of efficient **liquidity management** is measured by two variables. We use the log of total assets (LOGSCALE) and the log of the age of the bank (LOGAGE). The explanation for LOGSCALE is obvious. Larger banks have higher but less variable payment flows and moreover have the resources to invest in efficient liquidity management. Therefore the coefficient on LOGSCALE is expected to be negative. LOGAGE is less straightforward. We assume that there exist considerable learning effects in liquidity management. We assume that this learning process is exponential with time. Therefore we use the log of the age of Russian commercial banks. In our sample all banks are between one and seven years old. The older banks are expected to have learned over time to manage liquidity more efficiently. Therefore LOGAGE is expected to have a negative coefficient.

2.3.2. Presentation of results and interpretation

Table V.10. Excess reserves explained

Dependent variable: ER end 1994				
Included observations: 126				
No.	1	2	3	4
Constant	0.019 ***	0.045 ***	0.110**	0.059 ***
	(3.637; 0.000)	(3.666; 0.000)	(2.335; 0.021)	(3.092; 0.003)
Payment system				
-CATA	0.151 ***	0.137 ***	0.123 ***	0.14 *
	(4.152; 0.000)	(3.802; 0.000)	(3.282; 0.001)	(3.841; 0.000)
Indirect Liquidity				
-POA	0.13 **	0.110 *	0.113 *	0.110 *
	(1.949; 0.054)	(1.743; 0.084)	(1.768; 0.08)	(1.703; 0.091)
Credit risk				
-TL2		- 0.045 **	-0.050 **	-0.049 **
		(-2.312; 0.022)	(-2.551; 0.012)	(-2.494; 0.014)
Liquidity management				
-LOGSCALE			-0.008 **	
			(-1.46; 0.146)	
-LOGAGE				-0.022 **
				(-1.045; 0.298)
Adjusted R²	0.234	0.253	0.262	0.255
F-statistic	20.041	15.088	12.087	11.711

White heteroskedasticity-consistent standard errors & covariance
For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.
T-statistics and t-probability are in brackets.

Interpretation

None of the equations in table V.10. rejects the hypothesis that the inefficiency of the payment system has caused high excess reserves. This is shown by the high significance of CATA in all equations. Next, POA showed at least 10% significance in all equations. Apparently profitable banks hold more excess reserves. Therefore the hypothesis, that banks with high excess reserves have excess liquidity, is not rejected. Together these two hypotheses explain more than 23% of the variation (see equation no. 1 in table V.10.).

In equation Nos. 2, 3 and 4 we added respectively credit risk, the scale of the bank and the age of the bank. LOGSCALE and LOGAGE show the right sign but are not significant. The hypothesis of inefficient liquidity management is rejected. However the rejection is not very strong for LOGSCALE (equation no. 4). The bank-specific credit risk hypothesis could be clearly rejected in our bank-based analysis. The measures for credit risk were significant at the 10%-level but showed the wrong sign. Apparently banks with low excess reserves have ceteris paribus been depleting excess reserves in order to grant credits to enterprises and banks, rather than reserving extra money to cover the risk. Nevertheless Berglöf and Roland may still be right. If credit risk is systemic in Russia its influence on excess reserves may only show in comparison with other countries. Or in other words credit risk may not influence the

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variation of excess reserves within Russia but rather the average level of Russian excess reserves when compared to other countries.

The analysis corrects the interpretation of high excess reserves as direct proof that Russian banks were not liquidity constrained by required reserves in 1994. At least part of the excess reserves is explained by payment system problems. Note that in 1994 the excess reserves had already reached moderate levels, when compared to 1992 or 1993. Nevertheless, the hypothesis that banks were not liquidity constrained by required reserves could not be rejected either, because we find profitability (POA) to be a significant variable in the explanation of excess reserves. So, large excess reserves are to some extent a sign of excess liquidity in the banking system. In section 3 we find further support for this argument. In section 4 we will explore the joint relation between excess reserves, performing loans and bad loans. There we find that loan pricing is a crucial factor to understand high excess reserves in Russian banking.

3. GKO

3.1. Definition of GKO

Under pressure from the IMF the Russian government had to find market-based methods to finance its budget deficit, because the practice of monetary financing was rightly conceived to be the cause of continued inflation in 1992-1993. The obvious solution was to issue treasury bonds, the so-called GKO[8]. GKO are zero-coupon bonds that are issued by the Ministry of Finance by American tender. The bidding is conducted by licensed dealers, who can submit bids on their own account or on account of clients. The biddings can be competitive or non-competitive, which means that the dealer bids the amount he is willing to buy at the average price of the auction. In conformity with resolution no. 107 of the Ministry of Finance, the CBR acts as an agent for the Ministry of Finance and organises the auctions of GKO (see Korhonen, 1997). GKO were in 1993-1994 only issued in Moscow. Moscow-based banks alone could reap the full benefit on the primary market, since the CBR started regional primary auctions of GKO only in 1995. Outsiders were largely excluded from the GKO-market. As a rule foreign investors have been limited to a maximum of 10% of every auction. The CBR is allowed to submit non-competitive biddings (Korhonen, 1997). As a consequence the CBR cannot influence the price of GKO, but only the volume issued. The CBR can intervene directly or through Sberbank. Indeed, Sberbank is the largest investor in GKO. On 1 January 1995, Sberbank had 2.1 trillion rubles of GKO in portfolio (Sberbank, 1995). According to CBR-data, this is more than 20% of open GKO at that time (see table V.12.). In a way Sberbank functions in the traditional Soviet way. It collects savings from the public and lends them to the state budget through GKO[9]. This dominant position of the CBR and Sberbank has increased lately as shown in table V.11.

Table V.11. Who buys the GKO ?

	01/05/95	01/01/96	01/07/96
CBR	25.2 %	36.6 %	37.3 %
Sberbank	24.8 %	30.5 %	40.7 %
Commercial banks	48.1 %	32.5 %	21.2 %
Source : CBR, 1996, Tekushie Tendentsii v Denezhno-Kreditnoi Sfere, No. 9, 1996			

Table V.12. Basic data on GKO-issues in 1994

No.	Date	Term (days)	Offered	Subscribed(S)	Revenue(R)	Average price (% of pari)	YTM (a)
				(millions of rubles)			
21009RMFS	18-01-94	91	130000	108475	76030.4	76.88	316%
21010RMFS	15-02-94	91	100000	99790	74444.1	74.6	224%
21011RMFS	15-03-94	91	175000	173019	125940.7	72.79	257%
22002RMFS	16-03-94	182	15000	14973	8468.9	56.56	214%
21012RMFS	19-04-94	91	300000	298619	224144.3	75.06	216%
21013RMFS	17-05-94	91	400000	399339	309525.9	77.51	178%
22003RMFS	17-05-94	174	50000	49727	33058.3	66.48	135%
21014RMFS	21-06-94	91	1500000	1497400	1190256	79.49	151%
22004RMFS	21-06-94	174	160000	154780	106287.7	66.52	120%
22005RMFS	12-07-94	182	300000	297680	195956.5	65.83	131%
21015RMFS	19-07-94	91	1000000	989800	791470.6	79.96	145%
21016RMFS	02-08-94	91	600000	595630	477944.9	80.24	142%
22006RMFS	09-08-94	189	600000	352455	229623.2	65.15	129%
21017RMFS	16-08-94	98	600000	547391	447545.3	81.76	112%
21018RMFS	06-09-94	91	900000	898985	761293.6	84.68	95%
21019RMFS	20-09-94	92	1100000	1097946	917350.7	83.55	104%
22007RMFS	21-09-94	168	1100000	882898	624121	70.69	112%
21020RFMS	05-10-94	91	1000000	433939	343101.5	79.07	157%
21021RMFS	13-10-94	90	1000000	952996	665935.7	69.88	328%
21022RMFS	18-10-94	92	1400000	1186537	1001213	77.22	96%
23001RMFS	26-10-94	364	200000	60496	15443.2	25.53	293%
22007RMFS-II	27-10-94	132	500006	233061	137955.5	59.19	326%
21023RMFS	01-11-94	92	1300000	753317	610000	67.53	131%
22008RMFS	08-11-94	183	400000	206057	102800	49.89	300%
22006RMFS-II	16-11-94	90	400000	397327	287500	72.38	271%
21024RMFS	22-11-94	85	1000000	957327	698700	72.98	287%
23001RMFS-II	30-11-94	329	400000	104405	37600	36.02	211%
21025RMFS	06-12-94	85	1400000	1399629	1021300	72.97	287%
22009RMFS	13-12-94	183	600060	457577	231000	50.49	291%
21026RMFS	21-12-94	84	1700000	1606100	1104100	68.74	410%
23001RMFS-III	27-12-94	302	200000	52819	16300	30.77	314%

(a) YTM is the annualised yield to maturity of the GKO calculated as $((R/S)^{365/term})- 1$

Source: CBR-data (Tekushie Tendentsii v Denezhno-Kreditnoi Sfere) and own calculations for the yield

On 10 May 1993 the first tender of GKO was held in Moscow. The bonds had a maturity of three months. The first tender was not very successful but gradually GKO became more and more important. In December 1993 were issued the first bonds with a maturity of 6 months and in November 1994 the first bonds with a maturity of 12 months. Table V.12. shows some basic data for 1994.

3.2. The role of GKO in liquidity management of banks

Table V.12. shows nominal yields on GKO. After subtracting inflation, the real interest rates show a different picture. In fact the first positive real yield was paid on GKO issued in January 1994 and maturing in April 1994. Even in 1994 real interest rates were not always positive and sometimes wildly negative[10]. Banks were willing to forego alternative investments with positive returns and lent money to the budget at negative real interest rates throughout 1993. There exist two explanations for this behaviour.

Possibly banks had downwards biased expectations for future inflation. In this case ex ante expected yields may have been positive while ex post the real yield turned out to be negative. This scenario of inflation surprise is however unlikely when we bear in mind the predictability of Russian inflation on the basis of simple monetary aggregates that were available to banks (see section 1.). The second explanation is that banks substituted GKO for some of their excess reserves. Indeed the availability of GKO gives banks the opportunity to substitute interest-bearing GKO with maturity of 3 months for zero-interest excess reserves. Banks substitute GKO for excess reserves even if the real return on GKO is negative, simply because GKO provided an asset that was safe (guaranteed), liquid (a secondary market soon developed) and more profitable (positive nominal interest rates) than holding excess reserves.

This second explanation is at first sight supported by the data. Granville (1995) finds that the decrease in the ratio excess reserves/GDP in 1994 can be explained by the growth of GKO held by banks. Adding GKO to excess reserves and dividing by GDP would deliver more or less a constant in 1994. This suggests that banks did indeed substitute GKO for excess reserves.

3.3. Empirical analysis

3.3.1. Methodology, data and variables

We analyse whether GKO allowed banks to manage liquidity more efficiently by lowering excess reserves. We build on our cross-sectional analysis in section 2 with ER as dependent variable. We add to this analysis a variable that measures the investment in GKO and whether the additional variable has any explanatory power for excess reserves. Given the substitution hypothesis, we expect a negative coefficient.

The additional variable is called GKO. We have data for all banks on the ruble amount invested in state bonds, mainly GKO. Bonds can be held by anyone, but primary purchases of GKO were held only in Moscow during 1993-1994. Also on secondary markets they were distributed mainly in and around Moscow[11]. Therefore we assume that GKO were mainly held by Moscow banks and that in Moscow the data on state bonds mainly contained GKO. Therefore we approximate the amount of GKO as follows:

GKO = MOSCOW * (state bonds/total assets), with MOSCOW as the usual dummy variable.

3.3.2. Presentation of results and interpretation

Table V.13. shows that the coefficient for GKO is significant and negative, as predicted. Compared to table V.10., adjusted R^2 of equation No. 1 increases with only 1.5%. The small improvement in R^2 was to be expected since GKO equals zero for 89 out of 127 banks. The hypothesis that investment in GKO is partially explained by a substitution of GKO for excess reserves, cannot be rejected. Since the coefficient differs substantially from -1, the substitution explains only part of the GKO-investment. Every ruble invested in GKO decreased ER with about 0.3 rubles. This supports the idea that excess reserves consisted at least partially of excess liquidity waiting for an investment. Hence banks held excess liquidity in 1994.

Table V.13. The role of GKO in liquidity management

Dependent variable: ER end 1994			
Included observations: 127			
Variable	Coefficient	t-Statistic	Prob.
C	0.021295 ***	4.048648	0.0001
CATA	0.137657 ***	3.780270	0.0002
POA	0.163147 **	2.319208	0.0220
GKO	-0.294542 **	-2.538438	0.0124
Adjusted R²	0.247323		
F-statistic	14.69129		

White heteroskedasticity-consistent standard errors & covariance
For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.

We must conclude that by end 1994 the commercial banking sector as a whole was still not liquidity constrained, but rather holding excess reserves. The decline in production in 1992-1994 can thus not be fully explained by strict monetary policy and the subsequent credit crunch. Berglöf and Roland (1995) put forward that banks chose deliberately to ration credit and hold excess reserves as a response to bad loans. The problem of bad loans is indeed important and is analysed in detail in section 4 and chapter VII. There is however another explanation. Maybe demand for bank loans was low, because of the prevailing high loan rates. This hypothesis is further analysed in section 4.4.

4. Credits to enterprises

4.1. Introduction

One of the main roles of a banking system in the development of a country is financing the private sector. Financing of enterprises' working capital, investment and trade are important. Financing working capital and trade is a short term operation, while financing investment is a long term arrangement. In a country with high uncertainty and high inflation, as was Russia in early transition, any long term arrangement is troublesome. It is to be expected therefore that financing of trade and working capital will be more available than financing for investment.

Theory learns that banks are more efficient than markets, only in the case of market inefficiencies, the most important of which is asymmetric information. Information in Russia indeed is at best asymmetric. Banks have advantage over markets in these circumstances because they can act as delegated monitors (Diamond, 1984). This reveals one of the central functions of banks. They screen and monitor entrepreneurs and their projects on behalf of their depositors. For Russian banks this role is entirely new. In Soviet times, it was never their duty to screen and monitor the viability and profitability of investment projects (see chapter II). On the other hand this role of banks is crucial to the Russian transition process. Enterprises need restructuring and refinancing at a large scale. Liberalisation and privatisation gave enterprises new opportunities but also new responsibilities. They had to manage their financial situation themselves. Automatic coverage of losses and financing of investments was stopped. Both banks and enterprises lacked experience with bank financing of investment projects.

One can rightly question whether there actually was any demand for long term investment in 1992-1994. All data sources indicate that in this period real GNP fell with more than 30%. There are off course discussions about the reality of this figure[12]. Nevertheless, it remains certain that Russia experienced a serious depression. It seems unlikely that investment demand would be strong in these circumstances. On the contrary, the accelerator mechanism of aggregate investment is supposed to cause investment to fall even stronger than GNP. Also the instability of the political, legal and economic environment was not very conducive to long term investment[13]. Popular distrust must have been huge in early transition. Statistics support this idea. According to RET, real GNP decreased with more than 30% in 1992-1994, while expenditures for new investment and construction decreased with more than 60%[14]. Compelling evidence is also provided by the dollarisation of the Russian economy and the huge capital flight (see chapter III, section 3). Most estimates of the capital flight during 1991-1995 show a number of somewhere between 50 and 100 billion dollars, which is at least ten times higher than foreign direct investment in Russia during this period. The picture is convincing. Domestic investment has fallen to very low levels. Many Russians even prefer to flee with their capital instead of investing it in the domestic economy.

It is clear that investment demand decreased in the period under study. The question is whether actual investment was even lower than investment demand due to the additional constraint of credit market imperfections, or not. Therefore lending behaviour of Russian commercial banks is the main research focus in this section. Lending behaviour concerns three things, namely the volume of credits issued, the credit interest rate charged and the quality of the resulting portfolio, all of which will be considered jointly in this section.

4.2. Various theoretical issues concerning credits by Russian commercial banks

Several theoretical issues have emerged in the analysis of bank credits in transition countries. The first one is the issue of soft credits and soft interest rates. Soft credits and soft interest rates are two forms of the 'soft budget constraints' (Kornai, 1986), that are typical of centrally planned economies. During transition soft budget constraints phased out only gradually. Their representation forms are soft prices, soft subsidies, soft credits and soft interest rates. Soft prices and soft subsidies fell with a shock to low levels, due to price liberalisation, privatisation and stricter fiscal policy. Their remainders (for example low prices for energy and housing and subsidies to agriculture and the defence industry) are gradually phasing out. Our interest is mainly in soft credits and soft interest rates. In the first years of transition the CBR continued to allocate and distribute a lot of investment credits by means of centralised credit resources (CCR). The practice of CCR did certainly not promote the development of monitoring skills at the heart of these former state banks, but rather reinforced the banks' passive attitude (see chapter III). Creditor passivity will be analysed more in detail in chapter VII. CCR gradually phased out, but continued till the end of 1994. It is reasonable to assume that the banks involved, were foremost former state banks, since they had the appropriate connections with the CBR and the enterprises concerned. One might argue that the new and inexperienced banks did not necessarily allocate credits better than the state or the CBR. There seems to be some evidence to refute this argument. Granville (1994) finds indications that quite a lot of the CBR credit expansion to enterprises has not been used for investment but for currency speculation and capital flight, and thus was totally ineffective. In brief, we expect that soft credits and soft interest rates persisted during the transition, which prohibited

the development of the needed skills at the heart of the commercial banks and led to abuse by the enterprises-beneficiaries.

Next, theory seems to indicate that **collateral**, or rather the lack of it, may play an important role in the emerging Russian credit market. In the Russian inflationary and unstable environment reigns great uncertainty and hence lender risk aversion. This tendency is reinforced by the systemic bad quality of loans. Risk aversion urges lenders to replace risky prospects by a certainty equivalent, which may be high collateral. In addition, high inflation and shifts in relative prices make the valuation of assets more difficult and increase the likelihood of disagreements concerning a borrower's creditworthiness. Chan and Kanatas (1985) showed that, in this situation of asymmetric valuations of a project, if the lender has a lower valuation than the borrower, then the borrower has an incentive to offer additional collateral in exchange for better loan conditions. We can interpret this as follows. Given the general instability of the economy, the existing information base deteriorates quickly, which causes a need for additional costly information to be transferred to the lender. This can be done either directly or indirectly by means of collateral in a signalling context. The collateral serves as a vehicle for conveying information about the borrower's assessment of the quality of his project to the lender. It is a sorting device for the type of the borrower or his project. Low-risk borrower's reveal their type by accepting higher collateral in exchange for lower loan rates.

Besanko and Thakor (1987) showed that monopolistic credit markets do not use collateral as a sorting device because it is inefficient. Collateral will only be used if it is sufficiently valuable to make the loan riskless (p. 671). So, collateral tends to be absent or very high in these markets. The latter may be the case in the early stage of transition.

Fourth, high collateral can be used to counter the moral hazard problem of default. In this case the collateral does not function as a signalling, but rather as a disciplinary device. Higher collateral implies a lower net expected value of business failure for the borrower. The net value of business failure is relatively high in Russia, as bankruptcy procedures are weak and legal ways to enforce the part of the loan, uncovered by collateral, are quasi non-existent.

There is even anecdotal evidence of loan contracts where collateral exceeds the nominal value of the loan. This is explained by the general instability and the subsequent diverging valuations of the collateral involved.

Theory seems to suggest that Russian credit markets may suffer from very high collateral levels. This is confirmed by data from the World bank survey of 439 large and medium Russian industrial enterprises conducted in mid-1994 (Fan, Lee and Schaffer, 1996). They found average collateral levels of 120 % of the loan (p. 4). Unfortunately, in the context of transition this may function as an adverse selection mechanism. Since only existing (and mostly inefficient and formerly state-owned) enterprises can supply the required collateral, the predominance of collateral functions as an additional entry barrier to bank credit for new private enterprises. Campbell (1994) indeed mentions that the overcollateralisation discourages the growth of new private businesses.

Another important slice of banking theory considers the phenomenon of credit rationing. Economic theory suggests that credit rationing may emerge as a normal market practice. Stiglitz and Weiss (1981) showed for market economies that setting interest rates below market clearing levels and hence credit rationing can be a profit maximising strategy for

commercial banks, because higher interest rates, may actually decrease expected profits. This effect is caused by the adverse incentive and adverse selection properties of higher loan rates. Safe and creditworthy borrowers are discouraged by the high loan rates and drop out of the credit market (adverse selection). Borrowers that receive credit are tempted to choose riskier projects with a higher expected profit for themselves, but also a higher expected default (moral hazard). The purpose of credit rationing is to maximise profit by setting loan rates to non market clearing levels and thus avoid adverse selection and adverse incentive effects.

Theory allows market equilibria with credit rationing. This however requires good performance of commercial banks in screening and monitoring. If this is not the case, profits under credit rationing will be lower than profits with market clearing interest rates. Credit rationing in Russia was to a considerable extent performed by the CBR by means of CCR in 1992-1994 (see chapter III) and pocket banks by means of insider lending. One might argue that the specific Russian form of credit rationing was not only inefficient, but in a way perverse. Probably the rationing resulted in a form of soft credits to former state-owned enterprises and insider enterprises, while creditworthy private enterprises were restrained from bank credit by high loan rates. Russia's credit markets in 1992-1994 may have shown a strange form of separating equilibrium. The privileged few received cheap credits from the CBR or pocket banks, without having to prove their creditworthiness. Others had to swallow high loan rates with the obvious negative effects identified by Stiglitz and Weiss (1981). Modestly profitable investment projects were not financed and depended entirely on retained earnings, which hampered their growth[15]. If this theoretical scenario has realised, then **Russia has combined a perverse form of credit rationing with the adverse incentive and adverse selection effects of high loan rates and high spreads,** getting the worst of two worlds. Anecdotal evidence indicates that this equilibrium realised in Russia, as shown in table V.14.

Table V.14. The perverse separating equilibrium of loan rates

Region	Jun-93	Sep-93	Dec-93	Mar-94	Jun-94	Sep-94	Dec-94
			State enterprises				
Moscow	131.9	181.1	204.1	213.2	186.1	139.8	166
North-West	134.5	210.1	223	225.8	212.4	170.9	156
Ural	139	227.9	235.4	258.4	222.6	144.5	177.4
Western Siberia	103.5	148.9	190.7	207.8	195.1	137	150.5
Eastern Siberia	116	208.5	234.7	240.7	213.5	170.3	177.7
			Non-state enterprises				
Moscow	159.6	194.9	217.4	224.8	193.6	144.1	174.1
North-West	166.2	217.4	238.6	251.4	225.7	146.4	182.3
Ural	172.8	232.8	253.3	287.9	261.6	165.1	173.9
Western Siberia	156.4	194.8	226.2	225.8	210.6	155.9	161.4
Eastern Siberia	130.7	209.2	258.6	260.5	223.8	162	176.8
		Difference in % between state and non-state enterprise					
Moscow	21.0%	7.6 %	6.5 %	5.4 %	4.0 %	3.1 %	4.9 %
North-West	23.6 %	3.5 %	7.0 %	11.3 %	6.3 %	-14.3 %	16.9 %
Ural	24.3 %	2.2 %	7.6 %	11.4 %	17.5 %	14.3 %	-2.0 %
Western Siberia	51.1 %	30.8 %	18.6 %	8.7 %	7.9 %	13.8 %	7.2 %
Eastern Siberia	12.7 %	0.3 %	10.2 %	8.2 %	4.8 %	-4.9 %	-0.5 %
Source : CBR, 1994, Tekushie Tendentsii v Denezhno-Kreditnoi Sfere, various issues							

Another problem of commercial banks in all transition economies is their **undercapitalisation**. Undercapitalisation is also a problem for Russian banks (see chapter III). This may endanger the stability of the financial system. Credit risk is systemically high and the capital buffer of depositors against this risk is low. This may constitute a systemic threat to the banking system. The CBR countered this threat by providing a form of implicit deposit insurance in the form of the required reserves (see section 1) and by rising the capital requirements for commercial banks. Both minimum nominal capital and capital adequacy requirements have risen recently. In our period of study, this 'equity gap' may have created specific adverse effects. High reserve requirements forced banks to hold more reserves and less assets (see section 1). We showed in section 2 that banks, in addition to required reserves, also held a substantial amount of excess reserves. This was at least partially due to deliberate excess liquidity. On the other hand capital requirements were rising. Increasing capital requires issuing new shares or retaining profits. It is not straightforward to see how banks could retain more profits, while maintaining large zero interest excess reserves. To banks that are too inexperienced to understand the adverse effects of high interest rates identified by Stiglitz and Weiss (1981), the most simple way to solve this problem may seem higher loan rates or equivalently higher interest spreads. These higher spreads lead to deterioration of loan quality and lower loan demand and hence to higher excess reserves. This mechanism is analysed in detail in section 4.4.

A last problem of bank credits in Russia is the extreme short term nature of credits[16]. This is explained by the high level of risk, due to political and economic instability. In this unstable environment, receiving bank credits to finance investment projects is close to impossible. This lack of bank financing of investment, was to some extent[17] compensated by the flow of CCR and DC in 1992-1994 (see chapter III). Stabilisation should enhance the prospect of investment credits in Russia. However, stabilisation was accompanied by lower CCR flows. In addition, banks were not able to get grip on the deposit market. As long as banks are not able to attract long term deposits as an alternative for CCR, bank financing of investment will stay low and enterprises will be urged to use retained earnings for investment, or to join financial-industrial groups (see chapter VII).

4.3. Loan pricing by Russian commercial banks

4.3.1. The classification of banks and loan pricing

Moscow-based banks

Moscow has without any doubt become the financial capital of Russia. This can be seen from every bank statistic available. Volumes on loan markets, deposit markets, bond markets, equity markets, interbank markets and currency exchanges are much larger in Moscow than can be explained by scale. As a simple example we take the number of banks. On 1 January 1995 there were 2517 banks in Russia, of which 939 in Moscow city[18]. Moreover, it has become the centre of payment settlement of the country (see chapter IV). The consequence for loan rates is obvious. We expect that loan rates are lower in Moscow than in the rest of the country. The two mechanisms, which induce these lower loan rates are the high liquidity levels in Moscow as the financial capital and higher competition in the loan market, which forces loan rates down.

State banks

Above, we showed that state banks were a vehicle for the distribution of CCR, which seems to support the hypothesis of soft credits and interest rates. Next, state banks suffer from their historical background. Former state banks inherited assets, liabilities and human capital from the monobank system. Personnel is not trained to monitor and screen investment projects. There exists an informal network of personal connections between state banks and (former) state enterprises (the old boys network of the communist nomenklatura) that will influence lending behaviour. Therefore it can be expected that state banks will show reluctance towards reform by not changing old habits and continuing to finance state enterprises. This again supports the hypothesis of soft credits and interest rates. However, the question is whether state banks will be softer than other banks. This is not obvious, because a large number of banks are pocket banks, which face a problem of insider lending. These banks are also expected to grant soft credits, namely to their main shareholders. In addition, these pocket banks have no experience at all in commercial banking, which can be both a burden and a bless. Therefore the question whether state banks will be soft, remains an open question.

National and regional banks

National and regional banks are able to diversify their credit risk. Also, they have the possibility to invest in screening and monitoring skills of their personnel. Therefore one would expect lower loan rates. The argument is equivalent to the argument for the scale of banks.

Scale

Last, we have to invest some time in the role of scale. By international standards, Russian commercial banks are very small. Scale effects are likely to be strong. Actually most banks may be operating below the minimum efficient scale. Larger, more efficient banks can afford to set lower interest spreads and still be profitable. Given the adverse selection properties of high loan rates, their loan quality will be better. Loan quality will also be better for other reasons. Larger banks have the ability to invest more time and funds in screening and monitoring, are less prone to insider lending, and by nature have better diversified credit portfolios, ceteris paribus. All this allows these banks to have lower loan rates and larger credit portfolios than smaller banks. The negative relation between scale and loan rates may not hold for state banks for reasons of cost efficiency, as explained at length in chapter VII.

4.3.2. The literature

Borrower relationships

Theoretical models of Kane and Malkiel (1965), Diamond (1989) and Diamond (1991) suggest that firms should be able to obtain more and cheaper financing in the capital markets by establishing close relationships with banks. Building close relationships produces reputation effects. The cost of monitoring is reflected in loan rates. With growing reputation, monitoring costs diminish and hence the loan rate decreases. This implies a negative relation between loan rates and the duration of the relationship. In Diamond (1991) close relation-

ships arise as a substitute for monitoring. Petersen and Rajan (1994) and Berger and Udell (1995) approach this issue empirically. Petersen and Rajan (1994) find that bank relationships do not affect loan rates but rather the quantity of credit obtained. Long standing relationships increase the availability of credit. Berger and Udell (1995) concentrate on transaction-based loans, which is representative for Russia. They find a negative relation between the loan rate and the duration of the relationships, which is however only significant in the subsample with large firms. Blackwell and Winters (1997) analyse the relation between borrower relationship and loan rates for small firms. They find that longstanding relations of the borrower with the lending bank reduce the monitoring cost for the bank. In a competitive environment some of the efficiency gain is passed to the borrower through lower loan rates.

Customer relationships

In Hodgman (1961) customer deposits give the customer power over the bank and will lead to lower loan rates for customers. Greenbaum, Kanatas and Venezia (1989) adopt a more general approach. They put forward that the amount and the number of customer services used by the customer, produce negotiation power of the customer with respect to the bank. However the services used (deposits, payments etc.) also reveal the type of the customer. This alleviates the information asymmetry and lowers monitoring costs. However, if the revealed type is bad by international standards, the net effect on loan rates is not so clear.

Capitalisation

The effect of capital requirements on the balance sheet has come under scrutiny in many empirical papers. Often these papers address the question whether capital adequacy requirements can cause a credit crunch. This has been done for example by Bernanke and Lown (1991), O'Brien and Browne (1992), Baer and McElravey (1993), Berger and Udell (1994) and Peek and Rosengren (1995). The relation between capitalisation and the loan rate is however largely unknown. The theoretical model of Bernanke and Gertler (1987) finds that a decrease in bank capital causes an increase in loan rates because banks shrink their assets by charging higher rates. This implies that loan rates are inversely related to capitalisation. Lown and Perestiani (1996) are the first to investigate the relation between capitalisation and loan rates empirically. They find that large poorly capitalised banks charge consumers a higher loan rate than highly capitalised institutions. In this way they curtail the credit portfolio. The findings only apply to consumer credits.

Collateral

The role of collateral has been analysed at many occasions. There is no consensus in the literature on whether collateral should be interpreted as a disciplinary device, as in Barro (1976) and Bester (1994), or rather as a sorting device, as in Bester (1985), Chan and Kanatas (1985), Besanko and Thakor (1987) and Bester (1987). Borrowers that supply high collateral are disciplined and urged not to default by the high value at risk in collateral. On the other hand the willingness of a borrower to put up with high collateral can be interpreted as a signal of the riskiness of his project. In this case it functions as a sorting device. Empirical work seems to support the role of collateral as a disciplinary device (Berger and Udell, 1990). The role of collateral in loan pricing has not been clearly put to the test yet.

Local loan market competition

Is seems straightforward that there exists an inverse relationship between competition and loan rates. Prices in monopolistic markets are as a rule higher than in competitive markets. There are however theoretical models that predict the opposite outcome, where less competition leads to lower loan rates. This is for example the case in Broecker (1990). Empirical work on the influence of local loan market competition on loan rates is absent.

Loan rates as a markup

Any price can be modelled as a markup on costs. For loan rates, the costs that could serve as a basis for the markup could be the deposit interest rate, capital costs or labour costs. There is no empirical work on the analysis of loan rates as a markup.

Adverse selection properties of loan rates and credit rationing

The adverse selection properties of high loan rates have been discussed at length in many theoretical papers. Several authors discuss whether, as a consequence of adverse selection, a pooling or rather a separating equilibrium will emerge. This has been done by Stiglitz and Weiss (1981), Riley (1987), Besanko and Thakor (1987), de Meza and Webb (1990), Hillier and Ibrahimo (1992), Boyd and Smith (1992), Smith (1994) and many others. Empirical work has concentrated on evaluating the existence of credit rationing in credit markets. This has been done by testing the stickiness of loan rates with the use of macro-data (Slovin and Sushka, 1983; King, 1986), with the use of bank loan data (Berger and Udell, 1992), or by estimating demand and supply functions for certain classes of loans with the use of sectoral data (Martin and Smyth ,1991; Drake and Holmes, 1995). The evidence found is ambiguous.

4.3.3. Validity of the literature for Russia and variables

If the duration of the borrower relation is inversely related to loan rates, this means for Russia that former state banks are likely to have lower loan rates. Only they had the possibility to have long-standing relationships with enterprises, given the young age of the Russian banking sector (see chapter II). Another factor that should be positively related to loan rates is the age of the bank. It is far from certain whether the data will support the borrower relation theory, since it has been partially rejected in empirical studies. Indeed the Petersen and Rajan (1994) result suggests that in Russia state banks and older banks may not charge lower loan rates, but rather grant loans more easily. The borrower relation does not affect loan rates but loan availability. Loan availability can be measured by the ratio of overdue credits to non financial enterprises divided by total assets (AVAILABLE). The independent variables are the age of the bank in years (AGE) and a dummy variable that indicates the origin of the bank (STATE). We also keep in mind that the relation between STATE and the loan rate is possibly affected by the cost inefficiency of the state banks. This is analysed in chapter VI.

Also the customer relation is relevant in Russia. Many banks were essentially 'pocket banks'. So, the Russian environment is likely to show customer power according to Hodgman (1961). The problem of insider lending could be a symptom of this. Also Greenbaum, Kana-

tas and Venezia (1989) are relevant. Given the severe information asymmetry in Russia, the additional information about customers, revealed by the consumption of customer services, may affect loan rates. One can expect that information of deposit and most of all payment flows is very valuable in this respect. We do not have data about loans, but we do have crossectional bank data. A good proxy for the information derived from payment activity is the level of current accounts and payment accounts held by enterprises at banks. The independent variable involved is the share of current accounts in total assets (CATA).

The capitalisation is not likely to be of much influence, since capitalisation requirements were low and weak. Moreover, capital adequacy requirements were shown to be dominated by nominal capital requirements (see chapter III). So one could not expect too much effect of capitalisation on loan rates. Nevertheless, one can imagine some relation between capitalisation and loan rates in Russia too. We showed that the deposit rate is mainly driven by the reputation of the bank. Large banks with a reputation of good loan quality and strong liquidity pay lower deposit rates. We also showed that banks tend to substitute deposits for rubles whenever that is cheaper (see chapter III). Therefore large banks with a good reputation are likely to have relatively low capitalisation, with the lower boundary of the capital adequacy constraint. These banks are also likely to demand lower loan rates, because they 1) want to keep their reputation high by avoiding the impact of the adverse selection properties of high loan rates on the quality of their portfolio and 2) in a competitive environment they will attract the best borrowers by pricing other banks out of the market and still make a profit, because their cost of financing is lower. So we expect a positive relation between capitalisation (CAP) and loan rates.

In Russia collateral is expected to function mainly as a sorting device. Due to the high systemic risk, loans are not granted without collateral. However the sorting may be perverse : Because of the skewed initial distribution of collateral, we expect no or rather an inverse relation between collateral and the prospects of the project involved. Most collateral was in hands of the inefficient (former) state enterprises. Small businesses on the other hand had none to offer. Therefore the readiness of a borrower to accept high collateral can not be unambiguously interpreted as a signal of the quality of his project. Unfortunately we have no data to check the role of collateral empirically.

Also the markup hypothesis is likely to hold in Russia. Bank know-how is limited. Banks want to show a profit. Possibly banks are tempted to set their loan spread as a markup to costs. The cost variables used in our study are the wage bill as a % of total assets (LABOUR) and the cost of physical capital (CAPITAL). If there exist economies of scale in Russian banking, the modelling of loan rates as a markup to operating costs gives an additional interpretation to the expected negative relation between scale and loan rates. Economies of scale are analysed in chapter VI.

Local competition is certainly of importance in Russia, given the disintegrated structure of financial markets and the subsequent interest differentials, as documented above. We believe that this is an important factor. It is impossible to know exactly the local market situation of every bank. There may however be a good proxy for local market competition. Consider the deposit market : Sberbank dominates the market and sets the lower boundary for deposit rates that are equal for all commercial banks, all over the Russian territory. Remaining

differences in deposit rates, may to some extent be due to differences in the local deposit market competition. Holding loan quality constant, ruble deposit rates will be higher in regions with more competition. Therefore the deposit rate (ID) may be to some extent a proxy for the local market situation. Higher ID indicate more competition. If Broecker (1990) is right, less competition will lead to lower loan rates and hence the relation between ID and IL should be positive. Note also that one can alternatively interpret ID as a cost variable, on which loan rates are set as a markup.

With regard to the adverse selection properties of high loan rates, we expect that these will be severe. The concentration of bank debt in financially distressed firms has been observed in Poland (Gomulka, 1994), Hungary (Bonin and Schaffer, 1995) and to a lesser extent Russia (Fan, Lee and Schaffer, 1996). This indicates the presence of adverse selection. We will try to prove that high loan rates constitute the mechanism that drives adverse selection. In our analysis we use the quality of the loan portfolio (BLTL), defined as bad loans over total loans. If adverse selection is at work, BLTL should by inversely related to the spread. A comfortable side-effect of the inclusion of BLTL in the estimation, is that it also controls ID for differences in the loan quality. Therefore the coefficients of ID mainly reflect regional differences in the level of competition and not the regional variation in loan quality.

4.3.4. Empirical analysis

4.3.4.1. Methodology and variables

We estimated an OLS on data from sample A(1994). This is to our knowledge the first analysis of bank loan pricing on the basis of Russian bank balance data.

The dependent variable is the loan rate IL.
Independent variables are :

•	A constant	C
•	Borrower relation	STATE; AGE
•	Customer relation	CATA
•	Capitalisation	CAP
•	Markup on costs	LABOUR; CAPITAL
•	Local market competition	ID
•	Adverse selection	BLTL
•	Control variable for scale	LOGSCALE

Because we suspect that borrower and customer relationship may affect loan availability rather than loan rates, we estimated an alternative relation. The dependent variable (AVAIL-ABLE) is defined as overdue credits to non-financial enterprises divided by total assets.

The independent variables are :

•	A constant	C
•	Borrower relation	STATE; AGE
•	Customer relation	CATA
•	Control variable for scale	LOGSCALE

4.3.4.2. Presentation of results and interpretation

Table V.15. Evaluation of different loan rate theories

Dependent Variable is IL				
Equation No.	1	2	3	4
C	2.034 ***	1.93 ***	0.259	
	(6.476; 0.000)	(7.133; 0.000)	(0.649; 0.518)	
MOSCOW	-0.253 ***	-0.259 ***	-0.049	
	(-4.464; 0.000)	(-4.631; 0.000)	(-0.996; 0.321)	
NATREG	0.042			
	(0.662; 0.51)			
STATE	0.116 **	0.1195 **	0.068	0.074 **
	(2.101; 0.038)	(2.171; 0.032)	(1.438; 0.153)	(2.317; 0.022)
AGE			-0.011	
			(-0.669; 0.505)	
CATA			0.381 *	0.515 ***
			(1.724; 0.087)	(2.862; 0.005)
CAP			-0.1196	
			(-0.186; 0.853)	
LABOUR			2.116 *	3.212 ***
			(1.66; 0.0996)	(3.475; 0.001)
CAPITAL			0.098	
			(0.943; 0.348)	
ID			0.692 ***	0.802 ***
			(9.131; 0.000)	(12.368; 0.000)
BLTL			0.31 **	0.309 **
			(2.348; 0.021)	(2.366; 0.0196)
LOGSCALE	-0.177 ***	-0.162 ***	-0.12	
	(-4.196; 0.000)	(-4.567; 0.000)	(-0.329; 0.853)	
Adjusted R²	0.314	0.317	0.598	0.598
F-statistic	15.332	20.391	19.62	47.544

White heteroskedasticity-consistent standard errors & covariance
For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.
T-statistics and t-probability are in brackets.

In equation 1 of table V.15., we see that the type of the bank has explanatory power for loan rates, with the exception of NATREG. The insignificance of NATREG is due to multi-collinearity problems with LOGSCALE. In equation 2, we excluded NATREG. The scale and the type of the bank explain about 32% of the variation in loan rates. All variables are significant, but not all variables show the expected sign. Indeed STATE shows a positive coefficient.

In equation 3 and 4 we add the other variables that follow from the literature. We see that this combination explains about 60% of the variation. Importantly, the significance of LOG-SCALE and MOSCOW vanishes with the introduction of the other variables. It seems as if these variables identify the underlying model that made LOGSCALE and MOSCOW signifi-cant in equation 1 and 2. However, the significance and the unexpected sign of STATE

remain. Also CATA is significant but shows the wrong sign. AGE was found insignificant. We conclude that the borrower relation and customer relation hypotheses with respect to loan rates are clearly rejected by the data.

However, customer and borrower relations may affect the availability of bank credit rather than the loan rate. In table V.16. we indeed see that state banks and banks with a large corporate customer base (CATA) have more bad loans in portfolio. This supports a mechanism as follows. Some good customers apply for credits but are very risky. Due to the good customer relation, they get the credit, but at higher interest rates. As a consequence we observe higher loan rates but poorer loan quality. This also gives some support to the idea of insider lending. We conclude that customer and borrower relationships do not induce lower interest rates, but rather increase loan availability. The softness of former state banks is apparently not in lower loan rates but in higher availability of loans and hence larger portfolios of bad loans. The explanation for this may be the sticky customer base of these state banks. Indeed, old state banks have a customer base that is sticky, and rooted in old relationships with large (former) state enterprises. Most of these enterprises face severe financial problems and cannot get a credit anywhere else. Therefore the state bank can enforce higher loan rates. However, it does so at the cost of higher loan default probability. Although state banks charge higher loan rates, it remains open whether this yields semi-monopolistic rents, since the higher rates might only exist on paper.

Table V.16. Loan availability versus borrower and customer relations

Dependent variable is AVAILABLE			
Equation No.	1	2	3
C	0.4204 ***	0.235 ***	0.162 ***
	(3.299; 0.0013)	(4.304; 0.000)	(2.642; 0.009)
STATE	0.0226 **	0.027 ***	
	(2.253; 0.026)	(2.764; 0.007)	
AGE	-0.0001		
	(-0.036; 0.971)		
CATA	0.056		0.086 *
	(1.158; 0.25)		(1.744; 0.084)
LOGSCALE	-0.022 ***	-0.025 ***	-0.017 **
	(-2.968; 0.004)	(-3.793; 0.000)	(-2.338; 0.021)
Adjusted R²	0.100	0.103	0.081
F-statistic	4.474	8.206	6.51

White heteroskedasticity-consistent standard errors & covariance
For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.
T-statistics and t-probability are in brackets.

Furthermore we see that in table V.15., capitalisation (CAP) is insignificant. The markup hypothesis is strongly supported for labour costs (LABOUR), but rejected for the cost of physical capital (CAPITAL). This is explained from a liquidity point of view. Capital costs are often non-cash in the form of depreciation and are irrelevant in the short run, while the wage bill has to be paid every month and requires a permanent flow of interest income. The local market competition hypothesis is not rejected by the data. The theoretical prediction of Broecker (1990) is empirically supported. Competition leads to higher deposit (ID) rates and to higher loan rates. This counter-intuitive result is explained as follows : More competition

may produce lower interest spreads, but the effect of lower interest spreads on loan rates is dominated by the effect of higher deposit rates. Therefore more competition increases loan rates. The significance of BLTL with the expected sign strongly supports the presence of adverse selection in the market. This will be further analysed in the next section. Lastly, we need to mention that scale seems to have no significant effect on the loan rate, but leads to better loan quality, as shown by the negative coefficient in table V.15.

4.4. The relation between loan rates, loan demand and loan quality

4.4.1. The model

We build a model for a banking sector with underdeveloped financial markets. On the liability side we have equity (E), which consists of charter capital and reserves, deposits (D) and centralised credit resources (CCR). The interest paid by the bank to depositors (i_d) and to the CBR (iccr) are not controlled by the bank. Both are exogenous variables for the bank[19].

On the asset side the bank has required reserves (RR) : RR(D) = r D, with r as the required reservation rate, determined by the CBR. These RR bear no interest. Next, the bank holds treasury bills (GKO), with interest rate igko determined by the CBR or the financial market and the level determined by external factors (the level of GKO on the market is limited). The remaining resources are invested in excess reserves (ER), which yield zero interest or in loans (TL). Loans can turn out te be good loans (GL) yielding an interest rate (i_l), or bad loans (BL). Bad loans are not penalised with liquidation losses in the profit function. In early transition, the penalisation of bad loans was low, because of the continuous bail-out of banks by refinance credits at negative real interest rates. The possible penalisation of bad loans by a liquidation of the loan concerned, was compensated by higher probability of subsidised refinancing by the CBR. Because of this ambiguity we excluded liquidation losses.

This setup delivers the following balance sheet

Good loans (GL)	Charter capital + reserves (CAP)
Bad loans (BL)	Deposits (D)
Excess reserves (ER)	Centralised credit resources (CCR)
Treasury bills (GKO)	
Required reserves (RR = rD)	
$\sum$ = Total assets (A) = 1	$\sum$ = Total liabilities (L) = 1

We express all balance categories as a proportion of total assets, with A and L equalling unity. This delivers the following profitability on assets (P):

$$P = (il \cdot GL) + (igko \cdot GKO) - (id \cdot D) - (iccr \cdot CCR) \qquad (5.2)$$

Due to the underdevelopment of financial markets, there is no investment alternative for loans or GKO, but excess reserves. This again fits the Russian situation. Section II and III in this chapter showed that banks were substituting GKO for excess reserves. Hence excess reserves are at least partially excess liquidity that cannot be invested better, due to the

underdevelopment of financial markets.

Banks can invest a given proportion of their assets $I = CAP + DEP (1-r) + CCR - GKO$. However, banks have no experience of screening and monitoring projects and entrepreneurs. Due to the general instability of the economy, information about the viability of projects does not exist. Therefore a separating equilibrium with credit rationing is not possible. The only option is a pooling equilibrium. In such an equilibrium a bank sets its interest rate i in order to maximise its profit. We model the loan rate as follows:

$$il = id + ss + sb \qquad (5.3.)$$

with ss symbolising the base spread in the bank sector and sb the individual spread set by the bank. We only have reliable data for the total spread s, with $s = ss + sb$.

Since id and ss are exogenous for the bank, setting il is equivalent to setting sb.

For $sb = 0$ and hence $s = ss$, the demand for bank loans $Ld = I$. At this point the probability of a good loan $Lq(s=ss)$ equals π.

For $sb > 0$ the bank is faced with two effects, namely the adverse selection effect of a higher interest rate margin sb and the negative elasticity of loan demand to the interest spread sb. Therefore we can model the quality of granted loans $Lq(sb)$ and the loan demand $Ld(sb)$ as decreasing functions in sb :

$$Lq(sb) = \pi\ e^{-\alpha sb} \qquad (5.4)$$
$$Ld(sb) = I\ e^{-\beta sb} \qquad \text{with } 0 < \alpha+\beta < 1/id, \qquad (5.5)$$

With   point elasticity of loan demand $= -\beta\ sb$
point elasticity of loan quality $= -\alpha\ sb$
The elasticity of loan demand and loan quality is thus increasing in sb.

A combination of both effects delivers the bank's holdings of bad loans ($BL(sb)$) and good loans ($GL(sb)$) and excess reserves ($ER(sb)$):

$$GL(sb) = Ld(sb) \cdot Lq(sb) \qquad = I\ \pi\ e^{-(\alpha+\beta)\ sb} \qquad (5.6)$$
$$BL(sb) = Ld(sb) \cdot (1-Lq(sb)) \qquad = I\ (e^{-\beta sb} - \pi\ e^{-(\alpha+\beta)sb}) \qquad (5.7)$$
$$ER(sb) \qquad = I\ (1-e^{-\beta sb}) \qquad (5.8)$$
$$Ld(sb) = GL(sb) + BL(sb) \qquad = I\ e^{-\beta sb} \qquad (5.9)$$
The sum of $GL(m) + BL(m) + ER(m)$ equals I by definition

Substituting (5.6) and (5.3) in (5.2) yields

$$P(sb) \qquad = I\ \pi\ il\ e^{-(\alpha+\beta)sb} + (igko *GKO) - (id*D) - (iccr*CCR) \qquad (5.10)$$
$$= I\ \pi\ (id + ss + sb)\ e^{-(\alpha+\beta)sb} + (igko*GKO) - (id*D) - (iccr*CCR)$$

Maximising (5.10) with respect to sb gives the following FOC:

$$\partial P/\partial sb \;=\; I\,\pi\,e^{-(\alpha+\beta)sb}\,[1 - (\alpha+\beta)\,(id + ss + sb)\,] = 0$$

which implies :
$$sb^* = (1/(\alpha+\beta)) - id - ss$$
$$il^* = sb^* + id + ss = 1/(\alpha+\beta), \tag{5.11}$$

with sb* and il* the profit maximising spread and loan rate.

Since a meaningful sb* implies that $sb^* \geq 0$, (8) also implies that:

$$0 < \alpha+\beta < 1/(id+ss) \tag{5.12}$$

which explains the boundary set in (2) and (3).

However, a bank which does not realise the adverse selection effect of its credit interest will neglect β. This produces an ex ante expected optimal margin m** :

$$sb^{**} = (1/\alpha) - id \tag{5.13}$$
$$> sb^*$$

Therefore, if banks underestimate adverse selection, they will set interest rates too high.

4.4.2. Good loans, bad loans and excess reserves under profit maximisation

We substitute (5.11) and (5.13) in (5.6), (5.7) and (5.8) and compare.

Substituting (5.11) and (5.13) in (5.6) gives:

$$GL(sb^*) = I\,\pi\,e^{(id(\alpha+\beta)-1)}$$
$$GL(sb^{**}) = I\,\pi\,e^{(id(\alpha+\beta))-1-\beta/\alpha} \tag{5.14}$$

Substituting (5.11) and (5.13) in (5.7) produces:

$$BL(sb^*) = I\,(e^{(\beta id-(\beta/(\alpha+\beta)))} - \pi\,e^{(id(\alpha+\beta)-1)})$$
$$= I\,e^{\beta id}\,(e^{-(\beta/(\alpha+\beta))} - \pi\,e^{(\alpha id-1)})$$
$$BL(sb^{**}) = I\,(e^{(\beta id-\beta/\alpha)} - \pi\,e^{(id(\alpha+\beta)-(\alpha/(\alpha+\beta)))})$$
$$= I\,e^{\beta id}\,(e^{-\beta/\alpha} - \pi\,e^{(\alpha id-(\alpha/(\alpha+\beta)))}) \tag{5.15}$$

Substituting (5.11) and (5.13) in (5.8) yields:

$$ER(sb^*) = I\,(1-e^{(\beta id-(\beta/(\alpha+\beta)))})$$
$$ER(sb^{**}) = I\,(1-e^{(\beta id-\beta/\alpha)}) \tag{5.16}$$

From (5.14) and (5.15) can be seen that GL(sb*) > GL(sb**) and ER(sb*) < ER (sb**). So, ignoring adverse selection leads to lower good loans and higher excess reserves. The effect on bad loans is not directly clear. However, (5.16) learns that :

$$BL(sb^{**}) > BL(sb^{*}) \Leftrightarrow (e^{-\beta/\alpha} - \pi e^{(\alpha id - (\alpha/(\alpha+\beta)))}) > (e^{-(\beta/(\alpha+\beta))} - \pi e^{(\alpha id - 1)}) \qquad (5.17)$$

One can verify that (5.17) holds for all positive parameter values. Hence $BL(sb^{**})$ is always smaller than $BL(m^{*})$. This result is contra-intuitive but will be explained below.

4.4.3. Estimation of the model

4.4.3.1. Methodology

Ideally we would like to estimate $GL(sb)$ according to (5.6), in order to jointly estimate $\alpha+\beta$. This would deliver the problem of splitting the estimated $(\alpha+\beta)$ in an estimated α and an estimated β. We could also simply estimate (5.4) and (5.5) to have separate OLS estimates of α and β. This leaves us with the problem that the according to (5.4) and (5.5) separately estimated α and β may not add up to the estimated $(\alpha+\beta)$ of (5.6). To counter these problems we jointly estimate (5.5) and (5.6), which delivers separate α and β that are consistent with the $(\alpha+\beta)$ of (5.6). The appropriate technique is seemingly unrelated regression (see Zellner). This technique is more efficient for the estimation of α, than the OLS variant (Greene, 1993, p. 489). The variable sb is also determined in the estimation process.

We use our sample A(1994). For all banks we have information on I, GL, TL and m. We do not have sb, but only m. So we jointly estimated :

$$Ld(sb) = I \; e^{-\beta(m-ss)}, \qquad \text{and} \qquad (5.5)$$
$$GL(sb) = I \; \pi \; e^{-(\alpha+\beta)\,(m-ss)} \qquad (5.6)$$

We also estimated an alternative equation. Not all banks have free access to treasury bills (GKO). Since GKO bear interest but excess reserves (ER) do not, a bank with a higher access to GKO will ceteris paribus decrease its loan portfolio. Indeed, if the share of reserves that is held in GKO increases, holding reserves becomes more profitable. The availability of GKO can be measured by the ratio GKO/ER. Name this variable GKOER, with as theoretical abbreviation ge. Then we can estimate :

$$Ld(sb,ge) = I \; e^{-\beta(m-ss)} \, e^{-\gamma \, ge}, \qquad \text{and} \qquad (5.18)$$
$$GL(sb,ge) = I \; \pi \; e^{-(\alpha+\beta)\,(m-ss)} e^{-\gamma \, ge} \qquad (5.19)$$

The parameters to be estimated are π, α, β, sb and for the alternative equation γ.

In practice we rewrote (5.5) and (5.6), and (5.18) and (5.19) in logarithmic terms and then estimated the two models with iterative seemingly unrelated regressions.

4.4.3.2. Presentation of results and interpretation

Table V.17. Results of the seemingly unrelated regressions of (5.5) and (5.6)

	Coefficient	Std. Error	t-Statistic	Prob.
π	0.968	0.033	29.74	0.000
α	0.123	0.046	-2.670	0.008
β	0.232	0.051	-4.572	0.000
ss	-0.386	0.132	-2.926	0.004

Determinant residual covariance	0.000267

Equation: $\ln(GL) = \ln(I) + \ln(\pi) - (\alpha + \beta)*(s - ss)$

R^2	0.368	Mean dependent var	-0.324
Adjusted R^2	0.352	S.D. dependent var	0.217
S.E. of regression	0.175	Sum squared resid	3.716

Equation: $\ln(TL) = \ln(I) - \beta*(s - sb)$

R^2	0.356	Mean dependent var	-0.223
Adjusted R^2	0.351	S.D. dependent var	0.169
S.E. of regression	0.138	Sum squared resid	2.289

Table V.18. Results of the seemingly unrelated regressions of (5.18) and (5.19)

	Coefficient	Std. Error	t-Statistic	Prob.
π	0.960	0.028	34.795	0.000
α	0.123	0.046	2.670	0.008
β	0.229	0.048	4.774	0.000
ss	-0.315	0.114	-2.753	0.006
γ	0.183	0.048	3.820	0.000

Determinant residual covariance	0.000241

Equation: $\ln(GL) = \ln(I) + \ln(\pi) - (\alpha + \beta)*(s - ss) - \gamma*ge$

R^2	0.348093	Mean dependent var	-0.323731
Adjusted R^2	0.326542	S.D. dependent var	0.216864
S.E. of regression	0.177968	Sum squared resid	3.832406

Equation: $\ln(TL) = \ln(I) - \beta*(s - sb) - \gamma*ge$

R^2	0.424815	Mean dependent var	-0.223080
Adjusted R^2	0.415462	S.D. dependent var	0.168621
S.E. of regression	0.128919	Sum squared resid	2.044273

Interpretation

We first note that all coefficients are significant at the 1%-level. Also, the coefficients show the expected sign, with the exception of ss. Coefficients from table V.17. are close to these of table V.18, which indicates the stability of the estimates.

Adverse selection exists ($\alpha = 0.12$) but is dominated by the interest elasticity of loan demand ($\beta = 0.23$). The estimated π is surprisingly high (0.96 to 0.968), which shows that the bad loans would not be such a big problem if there would be a separating equilibrium with credit rationing and lower loan rates and interest spreads. Indeed a high π means that the systemic nature of bad loans is still at an acceptably low level. An unexpected finding is the negative sign for ss. This indicates that the demand elasticity already starts at negative interest spreads. This is an indication that in the Russian banking market, there are banks lending at negative interest spreads and enterprises only wanting to borrow at these negative spreads. This is a strong signal of the prevalence of soft budget constraints for banks and enterprises and illustrates the lack of maturity of the Russian banking sector. Banks can only cope with negative spreads because they have other sources of income, such as currency exchange, currency speculation and treasury bills. This will be analysed more in detail in Chapter VI.

Table V.19. Interest rates in Russia during 1994

	Yield of refinance rate	Yield of interbank lending rate	Yield credit rate
January	592.6	619	636
February	592.6	612	658
March	592.6	596	682
April	592.6	555	666
May	549.6	435	564
June	423.5	301	499
July	329.6	277	386
August	284.4	226	333
September	243.6	214	289
October	311.0	272	381
November	412.2	361	525
December	435.0	364	666
Average 1994[20]	431	400	507

Source : Granville (1995), newspaper reports and own calculations

According to (5.11), il* = sb* + id + ss = $1/(\alpha+\beta)$. Hence our estimates deliver an il* of about 282%. Results may however be distorted by inflation. The data on deposit rates and loan rates used to calculate the spread are distorted by inflation. This leads to an underestimation of interest rates and hence of the spread. A simple analysis learns that in reality interest rates are about 76.4% higher[21], which leads to a corrected optimal il of 496%. Compared to an annual inflation of about 200%, we find a very high real interest rate of 98.7%. Nevertheless, this is a realistic value as shown in table V.19. In table V.19 we report the annual yield of the CBR refinance rate, the yield of the interbank lending rate, which is a lower boundary to loan rates, and the yield on credit rates. Apparently average 1994 market

loan rates were higher than the profit-maximising rate of 496%. Russian banks seem to underestimate the adverse selection properties of high loan rates and are as a consequence setting loan rates too high. This becomes even more clear, if one understands that we probably overestimated il*. First, banks report lower bad loans than they really have. According to sample A, the weighted average of Lq equals 94.6 %, while according to Goskomstat-data, Lq is in reality closer to 85% (Goskomstat, 1994). It is likely therefore that both π and α are underestimated and hence that our estimate of il* (496%) is too high. Second, inclusion of liquidation losses in the profit function would only punish bad loans more severely and cause a lower il*.

As shown theoretically in (14) this behaviour of setting interest too high, may actually lead to lower total bad loans on total assets, because loans on assets react stronger on an increase in interest rates than the proportion of bad loans. Total bad loans may decrease, but the proportion of bad loans in total loans (Lq) will with certainty increase.

This also gives an empirical interpretation of Berglöf and Roland's theoretical prediction that banks with a poor loan portfolio may choose to accumulate more reserves instead of granting loans. The mechanism through which the Berglöf and Roland (1995) conjecture realises is loan pricing and causation may in fact run in the opposite direction. Banks that underestimate the adverse selection properties of interest rates set interest rates too high. As a result loan quality is getting worse and excess reserves increase, without the latter being a direct reaction to the former. This also explains our findings in section 4.3. Section 4.3. of this chapter revealed that state banks have higher than average loan rates but also that their loan quality is worse than average. The link between these two findings is the adverse selection property of high loan rates, as identified in this section.

5. Interbank loans

5.1. General

The interbank market is mainly operating in Moscow, which is associated with high foreign currency deposits as indicated already in chapter III. Genuine interbank markets are very short term and are an instrument to optimise liquidity management of the banking system. End of day shortages or surpluses are respectively borrowed from or lent to other banks. However, in Russia this function was fulfilled to a large extent by free overdraft credit by the CBR (see chapter IV). Also refinance credits of the CBR to banks bore permanently slightly lower interest rates than interbank credits (see chapter III).

Before 1995 the Russian interbank market therefore fulfilled other functions. Typically, large banks with large deposit bases were net lenders to smaller banks with smaller deposit bases. The net borrowers on the interbank market were permanently the same banks. These banks actually used interbank credit as a permanent and stable source of funds in order to finance short term credits. This is close to a pyramid type of scheme. The banks concerned could only keep afloat by continuously rolling over interbank loans. These banks may have been profitable, but their liability structure was not sustainable. The cause of this flaw in the liability structure of many banks was their apparent inability to build a stable deposit base, which has been documented in chapter III. Net lenders continued to lend because they

considered the interbank market as very profitable indeed. This is confirmed by the analysis in chapter VI, section 4. Borrowers were prepared to pay high interest rates on interbank credits because these were exempt from reserve requirements. Indeed, the high reserve requirements on simple deposits made it very lucrative for smaller banks to attract interbank deposits. Even if the interest paid is higher, the real cost of interbank deposits might be lower, due to the reserve requirement exemption. In chapter VI we show that net lending on the interbank market was a significant source of profit in 1994. Apparently net interbank lenders earned easy interest income on loans that were perceived to be riskless. Indeed, before the August 1995 crisis, money was lent to the highest bidders without paying much attention to the credit rating or liquidity of the borrower. Credit risk was never an issue on the Moscow interbank market because no bank had ever failed on its debts.

In late August 1995 however some commercial banks were not able to recover their debts to other banks. This provoked a crisis of trust among commercial banks and the interbank market collapsed completely, with no transactions at all during some weeks. Kokorev and Remizov (1996) describe the crisis more in detail. In August 1995, Mezhregionbank was not able to meet its obligations on interbank credits. This was the first failure on the interbank market. As a consequence a lot of large net suppliers of interbank credit were starting to fear that their loans would not be returned and they curtailed their interbank business. Given the dependence of a number of banks on rolled over interbank loans, a number of banks was as a consequence indeed unable to meet their obligations. This process culminated on 24 August 1995, when the interbank market completely collapsed. As a result, about 150 banks were unable to close their positions in the evening and overnight interest rates rose well above 1000%.

The underlying cause of the crisis was the aberrant use of the interbank market by a number of banks. They used it not to cover liquidity needs, but as a permanent and major source of finance. The crisis changed quite some things for the better. Banks with large deposit bases were urged to engage directly in lending activities and develop the according know-how. Banks with small deposit bases were forced to invest heavily in building the needed deposit base. In the Russian financial press the crisis was therefore often referred to as a 'crisis of normalisation'[22]. In 1995 the banks had indeed already lost access to the easy flow of profits from currency speculation (see chapter VI), because the CBR had installed and enforced an exchange rate target zone policy. In August 1995 the easy but unsustainable profits from interbank operations disappeared. Also, inflation decreased and interest rates became ultimately positive in 1995. All this indeed forced banks to normalise their operations.

5.2. Who lends on the interbank market ?

5.2.1. Theory

We hypothesize that the net lenders on the interbank market are typically large Moscow-based banks with a large foreign currency deposit base. The reason why foreign deposits play a role is straightforward. First, a large proportion of interbank loans is in foreign currency. Second, interbank loans typically bear lower rates than direct loans to enterprises[23]. However, the cost of deposits for the lending bank is high, due to required reserves. Since currency deposits are exempt from reserve requirements, banks with high foreign currency

deposit bases typically have a lower cost of deposits and therefore are able to lend to other banks at relatively moderate interest rates and still make a profit.

5.2.2. Empirical verification

The hypotheses of 5.2.1. are easily tested out with a simple OLS on data from A(1994).

The dependent variable is IBA,
with IBA   = interbank loans / total assets.

The dependent variables are :
- MOSCOW   = the Moscow-dummy
- LOGSCALE   = ln (total assets)
- CURDEPS   = foreign exchange deposits / total deposits
- STATE   = the usual dummy for former state banks

We expect for obvious reasons that the (former) state banks will have lower interbank loans. Results are reported in table V.19.

Table V.20. Who lends on the interbank market ?

Dependent variable IBA				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
MOSCOW	0.062796 ***	0.017210	3.648870	0.0004
LOGSCALE	0.004066 **	0.001692	2.403368	0.0178
CURDEPS	0.158325 ***	0.047561	3.328889	0.0012
STATE	-0.023891*	0.012410	-1.925143	0.0565
Adjusted R²	0.333861			
F-statistic	21.88283			

White heteroskedasticity-consistent standard errors & covariance
For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.
T-statistics and t-probability are in brackets.

The results in V.20. do not reject our hypothesis. Indeed, we even explain more than a third of the variance in IBA with this very simple specification. The relation between profitability and activity on the interbank market will be analysed in chapter VI.

Notes of chapter V

1. The implicit tax income from issuing cash and reserves is commonly referred to as seigniorage. Seigniorage income can be calculated according to two methods, namely the cash flow definition and the opportunity cost definition. The cash flow definition assumes that reserves are similar to currency. Revenue to the budget is the growth in reserves minus the interest possibly paid on these reserves. This definition implies that the implicit tax revenue from reserves can be negative, namely if reserves decrease nominally. The opportunity cost definition takes another stance. This approach assumes that reserves are a loan at low interest rates. The revenue from it is the difference between the interest paid and the interest that would have been paid if the budget would have had to finance with bonds. The problem here is that the interest rates that the budget would have to pay for bonds in the absence of reserves are unknown as long as reserves are in place. The sheer existence of required reserves may increase market interest rates and may thus deliver an upwardly biased estimate. A final aspect that is often forgotten is the extent to which the central bank is willing to transfer this implicit tax income to the government through dividends or cheap credits. Konopielko (1997) did not take this issue into account.

2. According to article 27 of the banking law of the Russian Federation and article 23 of the statutes of the CBR, the CBR can oblige commercial banks to deposit required reserves on accounts with the CBR. A short list of regulations issued by the CBR to implement the system of required reserves would look as follows:
- Instructions from the CBR, 30 April 1991, No. 1
- Indications from the CBR, 30 April 1991
- Telegram from the CBR, 29 December 1991, No. 218-91
- Letter from the CBR, 11 March 1992, No. 13-3-1/122
- Telegram from the CBR, 4 August 1992, No. 171-92
- Letter from the CBR, 15 February, 1994, No. 13-1/190
- Annex 1, 31 December 1994, No. 135
- Annex 2, 29 March 1995, No. 158

3. Interview with T. Paramonova on 24 June 1996, Bruges, Belgium.

4. Campbell (1994) gives an overview of transmission in Soviet times, which is still relevant for early transition years.

5. The literature considers two versions of M0, namely small M0, consisting of cash in circulation and required reserves (excluding excess reserves), and broad M0, consisting of cash in circulation and broad reserves (see Granville, 1995).

6. One useful exercise is to calculate the real monthly refinance rate of the CBR. We go into the refinance rate more deeply in other chapters. We only mention here that according to our calculations the real monthly refinance rate of the CBR became positive for the first time by end 1993.

7. See Young (1986) for a detailed explanation on the nature of float.

8. GKO is the widespread Russian acronym for short term state bonds.

9. Some have argued in favour of narrow banking in Russia. One could however look at Sberbank as a giant narrow bank. It is owned by the CBR, gives state guarantee on its deposits and puts its money in safe GKO. OECD (1997) reports that on 1 January 1997, Sberbank had invested 52.5 % of its assets in GKO. Moreover, it controlled more than two thirds of the individual ruble deposit market.

10. See CBR, Tekushie Tendentsii v Denezhno-Kreditnoi Sfere, for data on real yields on GKO.

11. The secondary trade in GKO was conducted by licensed dealers at MICEX. In 1996, 6 regional dealers were linked to the MICEX-trading system, but the trading volume was small. Regional banks were de facto excluded. Also foreigners were initially excluded from the secondary market (Vinokurov, 1996). We conclude that secondary trading was de facto reserved for Russian Moscow-based banks.

12. Critics argue that the old Soviet data were overstated. Plan-fulfilment or even over-fulfilment was highly rewarded, which indeed created a strong incentive to exaggerate production figures. Moreover, production statistics contained production that could not be sold because it did not satisfy any existing demand. At the same time current production is most certainly understated. Enterprises are now urged to understate production. This allows them to avoid taxes and criminal interest and creates room for capital flight. This underestimation is aggravated by the statistical system because the sectors that show most growth are barely captured by it. Indeed, the old state giants faced strongly decreasing production levels and this is shown in the figures. However, the new private enterprises (mostly service enterprises in sectors such as transport, communication, banks, security, distribution, personal services etc.) often grew strongly, sometimes without even being officially registered, let alone paying taxes. This creates a downward measurement bias. So in reality the decrease of production has been lower than stated by the official figures. This however does not allow us to conclude that the depression of the Russian economy did not exist. We only claim that it may have been less serious than indicated by the enormous 40% decrease in three years time.

13. Till end 1994, it was for example far from clear whether the reforms would continue or rather be reversed. Only the reelection of Boris Yeltsin as President of the Russian Federation in July 1996 finally secured the irreversibility of reform.

14. Own calculations, based on data from Russian Economic Trends, 1997, No. 2.

15. Fan, Lee and Schaffer (1996) report that 71% of the enterprises in the mid-1994 World Bank Survey said they would rely on retained earnings to finance fixed investments, 41% said they would rely on directed credits and only 30% said they would rely on commercial bank credit. This is logical since conditions on commercial bank credits were very unfavourable. Given the fact that directed credits are far more accessible to (former) state enterprises than to new private enterprises, new private enterprises have the choice between high loan rates of commercial bank loans or reinvesting retained earnings. This has certainly hampered growth of these enterprises and provoked adverse selection in credit allocation.

16. According to CBR-data, long term credits were less than 5% of total bank credits throughout 1992-1994. Long term is here defined as six months and longer.

17. As already mentioned, a considerable share of the CCR was unfortunately not used for investment purposes.

18. See the Bulletin of Banking Statistics, 1995, No. 1(20), CBR, table 6, p. 12.

19. It is straightforward to assume the refinance rate of the CBR exogenous. This is less straightforward however for the deposit rate. Analysis in Chapter II concluded the following two points: 1) Controlling for regional differences in interest rates, the structure of deposits, and the type of the bank, we found that deposit interest rates are a signal of the reputation of the bank. Risky banks have to pay higher interest rates. 2) Controlling for the type of the bank and the scale of the bank, we found that the scale of a bank's deposit base is related inversely to the deposit interest rate. Therefore adverse selection is at work. The deposit rate is constrained by the Sberbank lower boundary and is to a significant extent a proxy for the actual independent variable, namely the reputation of the bank, which explains the negative relation between deposit rates and deposits. This justifies the choice to consider interest rates as an exogenous variable for the bank. The best way for a bank to attract higher deposits is to gain a better reputation with depositors.

20. For every month the annual yield was recalculated as a monthly yield. Then, the 12 resulting monthly yields were compounded to find the resulting average annual yield.

21. Interest rates and the spread were calculated by dividing a flow variable by the end of period stock variable (Xe). Because of inflation (π) and real growth the calculated rates are an underestimation. We provide a simple correction for inflation distortions. The stock variable that should have been used is the average stock over the period. Using monthly inflation numbers from Granville (1995) we calculated for every month the nominal value that corresponds with the end of period stock value, assuming real growth at zero. This yields 13 monthly data that are constant in real terms. We multiply these 13 and take the 13-th root, which delivers the average of the stock value (Xa). The correction factor is: $c = Xa/Xe$. Since Xa was determined as $Xe*f(\pi)$ we see that $c = f(\pi)$. Hence c can be calculated with the use of inflation data only. We found a c of 1.764 for Russia in 1994, which means that interest rates are about 76% higher than indicated by the data.

22. See for example Kommersant, No. 32 (143), 5 September 1995.

23. One should consider interbank rates in the Russian case as wholesale prices. The interbank borrower then is retailer of the funds intermediated. Wholesale prices are logically lower than retail prices.

Chapter VI. Intermediation

0. Overview

In section 1 we address the question whether there is any relation between the bank's type and the spread. Since loan rates are a markup to operational costs, bank efficiency and economies of scale may play a role in loan pricing and hence in the interest spread. The presence of economies of scale is analysed in section 2. In section 3 we develop a simulation model for the interest spread that clarifies the contribution of several structural factors to the high level of Russian spreads. Section 4 analyses profitability of several banking operations, analysed in previous chapters. The line of thought is simple. We found in chapter V that Russian banks set spreads and loan rates too high. They probably do so because they set rates as markups to costs and do not understand the adverse effects of high loan rates. Still, banks kept afloat because they had other major profit sources but there are bound to fade out with time. Section 4 identifies these sources. As a result of this chapter we draw several conclusions :

- Spreads were high in Russian banking during 1994, but are likely to decrease in the future. These high spreads prohibited banks to assume an important role in the intermediation between savings and investment.
- Spreads are lower in Moscow-based banks and banks with regional coverage.
- Spreads are higher in state banks.
- The relation between scale and the interest spread is not very clear.
- This is also supported by the fact that we cannot find economies of scale in the Russian banking sector.
- We do however find that production technology of state banks and non-state banks differs substantially. This may be due to the fact that the former state banks inherited a branch network from their predecessors and have as a consequence very low costs of physical capital.
- The high spreads are explained reasonably well by the simulation model of section 3.
- The model shows that the large spread is due to inflation, financial repression through required reservation, CCR-dependence of banks, hard monetary policy, inefficient liquidity management and systemic problems with loan quality.
- The spread was tempered by high GKO-yields, negative real interest rates, low ROE requirements, low capitalisation and high income from alternative sources. Without these factors the spread would have been even higher.
- Stabilisation will certainly decrease spreads, but probably less than is thought at first sight, because the factors that tempered the spreads in 1994 are also likely to fade out with stabilisation.
- Therefore, as long as financial repression through required reserves is not lifted and the problem of systemic bad loan quality is not solved, interest spreads may remain relatively high.
- Currency speculation, net interbank lending, payment settlement and interest from state bonds are important alternative income sources.
- However, banks that are very dependent on currency speculation are not very profitable and are likely to disappear with stabilisation.
- Income from payment settlement on the other hand is very important to bank profitability and could stay so in the near future.

1. The interest spread, scale and the type of the bank

1.1. General

In chapter III we already found that banks were not very successful in collecting deposits. In chapter V we found that banks were setting loan rates too high. As a consequence spreads were very high and banks' credits to the economy were low. This caused desintermediation in the Russian economy, as can be seen from table VI.1. The spread differential between state banks and non-state banks supports the idea of a perverse separating equilibrium as theoretically argued in chapter V, section 4. Apparently banks were not very successful in their role of intermediaries between savings and investments in the Russian economy, which was to some extent due to the high interest spreads. In this section we will analyse the role of a bank's type in the explanation of high interest spreads.

Table VI.1. Interest spreads in Russian commercial banks

Region	Dec-93	Mar-94	Jun-94	Sep-94	Dec-94
			state enterprises		
Moscow	44.1	53.2	66.1	19.8	81
North West	63	65.8	92.4	50.9	71
Ural	75.4	98.4	102.6	24.5	92.4
Western Siberia	30.7	47.8	75.1	17	65.5
Eastern Siberia	74.7	80.7	93.5	50.3	92.7
Region			non-state enterprises		
Moscow	57.4	64.8	73.6	24.1	89.1
North West	78.6	91.4	105.7	26.4	97.3
Ural	93.3	127.9	141.6	45.1	88.9
Western Siberia	66.2	65.8	90.6	35.9	76.4
Eastern Siberia	98.6	100.5	103.8	42	91.8
Index of commercial bank credit to the economy in real terms					
December 1991 = 100	22.7	20.5	23.3	25.8	19.5
March 1992 = 100	77.7	70.2	79.9	88.3	66.7
Source : Own calculations based on CBR-data[1]					

1.2. Expectations

Moscow

In section 3 of chapter III we found that deposit rates in Moscow do not differ significantly from the sample average. However, if we include interbank funds, average Moscow-based banks pay higher deposit rates, because they are more dependent on interbank loans. In section 5 of chapter V, we found that Moscow-based banks have lower loan rates. We conclude that spreads are expected to be lower in Moscow than in the rest of the country.

State

In section 3 of chapter III we found that state banks have lower deposit rates. In section 4.3 of chapter V, we found that state banks have higher loan rates. It is straightforward therefore to expect higher interest spreads for state banks, which does not comply with the widespread belief that former state banks are soft and grant loans at low interest spreads. In chapter V, section 4.4, we already clarified that these high spreads also explain the bad loan quality in state banks.

Natreg

National or regional banks were not significant for the explanation of deposit rates, nor loan rates. This may be due however to multicollinearity with scale and with Moscow-based banks. Almost all national banks are Moscow-based and all national or regional banks are large. Nevertheless, it is possible that the spread of national or regional banks differs from the average spread. Given the argument in previous chapters we would expect lower spreads for these banks. It may be wise to split the category into national banks (NATIONAL) and regional banks (REGIONAL), because the multicollinearity is mostly a problem of national banks.

Scale

We found no relation between scale and deposit rates in chapter III. In chapter V, we found that scale is inversely related to loan rates. But the significance of scale disappeared when we introduced other variables. Also, we showed that loan rates can be modelled as a markup to operational costs, more specifically labour costs (see section 4.3.). So the limited significance of scale to the explanation of loan rates could be due to the fact that large banks have smaller operational costs, with loan rates as a markup to costs. This implies that there would exist - economies of scale in Russian banking. Economies of scale and markup pricing of loans could together explain the negative relationship between loan rates and scale. In section 2, we analyse this relationship between cost-efficiency and scale. If scale is not related to deposit rates and negatively related to loan rates, the relationship between scale and the interest spread is expected to be negative.

However, the relationship between scale and spreads may not hold for former state banks. - Large former state banks may have inherited an inefficient cost structure from their communist predecessors. More specifically there may be quite some excess labour in former state banks. This problem is likely to be more severe in larger state banks. If this is the case and if loan rates are indeed a markup to labour costs, then the relation between scale and loan rates (and hence spread) may be insignificant or positive for state banks. In section 2, we analyse whether the cost structure of state banks indeed differs from the cost structure of other banks, which would explain a possible distorted relationship between scale and spreads for state banks.

1.3. Empirical verification

We again use OLS to test out these hypotheses. The innovation is that we do not use sample A, but sample B(1994). Indeed in chapter III and IV, data requirements forced us to use sample A in most instances. From the analysis on sample A in previous chapters we drew the

hypotheses of this section. These hypotheses do not require much data to test. Therefore we test them out on sample B(1994), with 230 banks. This is to some extent an external validation of the findings in earlier chapters.

The dependent variable is the interest spread (S).
The independent variables are a constant, MOSCOW, STATE, REGIONAL, NATIONAL, and LOGSCALE. Section 3 of this chapter suggests that both excess reserves and required reserves are inversely related to S. Therefore we add CBRA to the relation in equation No. 2, with

CBRA   = (required reserves at the CBR + excess reserves at the CBR) / total assets.

We omit insignificant variables in equation No. 3. In equation No. 4 we look whether the effect of scale is different for state banks and non-state banks. Results are reported in table VI.2.

Table VI.2. Interest spreads and the type of the bank

Dependent variable is S				
sample B(1994), 230 banks				
Equation No.	1	2	3	4
C	0.375 ***	-0.036		0.398 ***
	(3.567; 0.000)	(-0.340; 0.734)		(4.099;0.000)
MOSCOW	-0.088 **	-0.054	-0.048 ***	-0.090 **
	(-2.268; 0.024)	(-1.55; 0.123)	(-2.781; 0.006)	(-2.382; 0.018)
STATE	0.097 **	0.055	0.061 **	
	(2.186; 0.03)	(1.400; 0.163)	(1.853; 0.065)	
REGIONAL	-0.074 *	-0.059 *	-0.054	-0.074 *
	(-1.85; 0.066)	(-1.711; 0.088)	(-1.577; 0.116)	(-1.962; 0.051)
NATIONAL	-0.012			
	(-0.303; 0.762)			
LOGSCALE	-0.017 *	0.0036		
	(-1.832; 0.068)	(0.424; 0.672)		
CBRA		1.523 ***	1.513 ***	
		(6.68; 0.000)	(8.92; 0.000)	
STATE*LOGSCALE				-0.011
				(-1.34; 0.163)
(1-STATE)*LOGSCALE				-0.019 **
				(-2.227; 0.027)
Adjusted R²	0.101	0.280	0.286	0.10
F-statistic	6.146	18.825	31.555	7.668

White heteroskedasticity-consistent standard errors & covariance.
For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.
T-statistics and t-probability are in brackets.

In table VI.2., we observe that our hypotheses are not rejected by the data. MOSCOW, STATE and LOGSCALE are significant and show the expected sign. It is shown that Moscow-based banks have lower than average spreads and state banks have higher than average spreads. The reasons for this have been set out in previous chapters. Scale also plays a role, which is clarified in the next section. NATIONAL is indeed insignificant, due to

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multicollinearity, while REGIONAL shows significance with the expected negative sign in equation Nos. 1 and 2 and comes at the brink of 10%-significance in equation No. 3. Adjusted R^2 of equation No. 1 is limited. The introduction of CBRA increases adjusted R^2 substantially and renders LOGSCALE insignificant. Apparently larger banks have lower spreads because they have lower excess reserves (and hence higher efficiency) and lower required reserves (and hence lower cost of deposits). The effect of required reserves and excess reserves on spreads is analysed more in detail in section 3.

2. Efficiency of Russian bank intermediation

2.1. General

Dewatripont and Maskin (1995) show that the decentralisation of credit markets induces one out of two equilibria. There exists an equilibrium with many small banks (say equilibrium A), and an equilibrium with fewer but larger banks (equilibrium B). They show that B is Pareto-superior to A and is characterised by higher credit volumes than A. One way to interpret these theoretical findings is that in equilibrium A credit volumes will be lower because interest spreads will be larger.

This is however not supported by the data. In chapter III, we found that the relationship between scale and the deposit rates was at best unclear (see table III.15.). In chapter V, we found that the relationship between scale and loan rates was also not very clear. After the introduction of the other variables, the significance of the scale completely vanished (see table V.15.). In section 1 of this chapter we observed that the relation between scale and the spread is unclear too. Significance vanishes completely, after the introduction of CBRA (see equation No. 1 in table VI.2.). Section 1 however also shows that one should distinguish between state banks and non-state banks. For state banks there is no significant relation between scale and the interest spread. For non-state banks however, there is a significant, substantial and negative relationship between scale and the interest spread (see equation No. 1 of table VI.2.). This difference between state banks and non-state banks with respect to the relation between scale and spread, may be due to different efficiency or different production technologies of state banks and non-state banks.

In section 2.2. we will visualise the relation between scale, efficiency and bank type, by means of some simple ratios. In section 2.3. we estimate cost functions and look whether we can find economies of scale and whether state and non-state banks have indeed different production technologies. The line of thought is the following. The finding, that loan rates and interest spreads are set as a markup to labour costs and deposit costs, holds for all banks, because the relationship was controlled for the influence of former state banks (see chapter V, section 4). Given the markup properties of loan rates and the exogeneity of deposit rates for the bank (see chapter III), efficiency differences could offer an explanation for the observed fact that smaller banks set higher interest spreads (in the case of non-state banks). One of the main explanations for these efficiency differences could be the existence of economies of scale. This would give an empirical interpretation of the Dewatripont and Maskin (1995) finding. The fact that the negative relationship between scale and the interest spread does not hold for state banks, would then imply that there are no economies of scale for state banks. The significance of the bank's type could also be explained by efficiency differences between the several bank types.

In short, we hypothesise that there is a relation between scale, type of the bank and bank efficiency, and that state banks and non-state banks have different production technologies, with economies of scale for non-state banks and no economies of scale for state banks. If these hypotheses cannot be rejected, we have identified one of the explanations for the negative relationship between the spread and the scale of the bank. However, since the relation between the scale and the interest spread is not very strong in the first place, we would not be too surprised to find nothing at all.

2.2. Some simple indicators

In order to have the maximum possible sample we use sample B(1994). One bank had to be deleted because of extraordinary outliers in some of the ratios, what left us with 229 banks. We use several basic efficiency ratios.

The first ratio is the asset requirement for one unit of revenue, calculated as total assets over total revenues (AR). Next follows the leverage (LEV) calculated as total assets over equity. A third ratio is the net margin calculated as profit over total revenues (NM). The fourth ratio is the interest margin (as opposed to the spread) calculated as interest revenue minus interest cost divided by the average of interest bearing liabilities and interest bearing assets (IM). Asset utilisation (AU) or asset rotation is the fifth ratio, calculated as revenues over total assets. AU equals 1/AR. A sixth ratio measures the operational efficiency and divides operational costs by total assets (OC). The seventh ratio is specific to Russia. It measures net non-interest income as a share of total revenues (OIR). The last ratio measures capitalisation or capital risk by dividing total equity by total assets (CAPAD2). CAPAD2 equals 1/LEV.

We calculate these measures for two bank types, namely state banks and Moscow-based banks and test whether their averages differ significantly from the estimates for other banks (see table VI.3. and VI.5.). We do this by means of a standard T-test. However, the significance of bank type for efficiency may be due to the influence of bank size. For example state banks are on average bigger than other banks and this may distort results. Therefore we split the data in 7 size groups and repeated the variance analysis (see table VI.4 and VI.6) within size groups. The seven size groups are : (1) total assets less than 20 mln, (2) 20 mln-50 mln, (3) 50 mln-100 mln, (4) 100 mln-200 mln, (5) 200 mln - 500 mln, (6) 500 mln - 2000 mln and (7) more than 2000 mln. Results are reported below.

Table VI.3. Are Moscow-based banks more efficient than other banks ?

Group description	No. of banks	AR	LEV	NM	IM	AU	OC	OIR	CAP
non-Moscow	106	2.477	13.050	0.181	0.183	0.460	0.054	0.143	0.098
Moscow	123	4.833	10.333	0.186	0.117	0.341	0.078	0.213	0.165
Total	229	0	0.009	0.407	0.002	0.000	0.003	0.015	0.000
T-sign. of difference		***	***	no	***	***	***	**	***

For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.

Table VI.4. Bank efficiency, size and Moscow as a financial capital

Group No.	No. of banks	AR	LEV	NM	IM	AU	OC	OIR	CAP
					non-Moscow				
1	18	2.040	9.198	0.178	0.312	0.550	0.064	0.067	0.144
2	25	2.276	12.371	0.142	0.164	0.481	0.062	0.165	0.098
3	18	2.107	12.855	0.205	0.218	0.501	0.051	0.130	0.096
4	18	2.696	12.874	0.185	0.150	0.443	0.043	0.142	0.080
5	13	2.635	16.350	0.210	0.120	0.391	0.053	0.190	0.079
6	10	2.792	16.238	0.170	0.117	0.377	0.035	0.127	0.084
7	4	5.074	17.604	0.248	0.094	0.240	0.062	0.295	0.080
Total	106								
					Moscow				
1	25	2.640	5.170	0.171	0.251	0.573	0.149	0.179	0.323
2	20	4.354	8.855	0.148	0.097	0.314	0.069	0.119	0.165
3	15	5.150	8.591	0.168	0.071	0.330	0.063	0.271	0.139
4	17	4.282	12.981	0.239	0.132	0.308	0.059	0.226	0.124
5	18	5.402	14.226	0.159	0.077	0.298	0.074	0.196	0.097
6	15	5.720	14.797	0.251	0.048	0.211	0.033	0.247	0.099
7	13	8.328	10.542	0.191	0.062	0.199	0.056	0.319	0.119
Total	123								
					T-significance of the difference				
1		no	***	no	no	no	***	*	***
2		***	*	no	*	***	no	no	**
3		**	**	no	***	***	no	no	**
4		**	no	no	no	**	no	**	**
5		**	no	no	no	**	no	no	no
6		***	no	*	**	***	no	**	no
7		*	no	no	no	no	no	no	no

For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.

Excluding the effect of bank scale, Moscow-based banks do not seem to be more efficient than other banks. Table VI.3. learns that asset utilisation is lower and operational costs are higher in Moscow-based banks. The intermediation margin is lower, which indicates higher competition. On the other hand, income from non-interest sources is more important as a share of total income (OIR) and capitalisation is also higher. Adding bank size alters the conclusions, as seen from table VI.4. Regrouped in homogenous size groups, banks' operational costs are not higher in Moscow, the smallest banks excluded. Capitalisation is higher in the four smallest groups, but in the three largest groups there is no significant capitalisation difference between Moscow-based banks and other banks. Apparently small banks can more easily attract capital in Moscow, while there is no difference for bigger banks. The asset utilisation conclusion seems to hold well across size classes. Moscow-based banks have lower asset utilisation and higher asset requirements in most classes. With respect to the intermediation margin and income from other sources, the sign of the difference is largely consistent across size classes, but the significance of the difference is rejected in some classes. For example the intermediation margin is lower in Moscow-based banks for all classes, but the difference is insignificant in groups 4 and 5. Interestingly, the net margin seems to be similar across type and size classes.

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Table VI.5. Are state banks less efficient than others ?

Group description	No. of banks	AR	LEV	NM	IM	AU	OC	OIR	CAP
non-state	166	4.021	10.403	0.171	0.138	0.391	0.074	0.191	0.154
state	63	3.009	14.720	0.218	0.175	0.410	0.048	0.152	0.083
Total	129								
T-sign. of difference		***	***	**	*	no	***	*	***

For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.

Table VI.6. Bank efficiency, size and the role of former state banks

Group No.	No. of banks	AR	LEV	NM	IM	AU	OC	OIR	CAP
					state banks				
1	4	1.368	14.592	0.087	0.234	0.744	0.053	0.052	0.080
2	10	2.100	13.538	0.149	0.180	0.502	0.075	0.179	0.069
3	7	2.306	13.425	0.256	0.304	0.450	0.054	0.124	0.094
4	12	3.049	12.398	0.254	0.190	0.400	0.042	0.163	0.102
5	10	2.822	17.701	0.235	0.147	0.379	0.045	0.171	0.062
6	13	4.114	16.652	0.225	0.112	0.310	0.029	0.120	0.079
7	7	4.098	13.914	0.253	0.132	0.292	0.049	0.216	0.099
total	63								
					non-state banks				
1	39	2.493	6.063	0.183	0.280	0.545	0.119	0.141	0.265
2	35	3.514	10.029	0.143	0.121	0.379	0.062	0.134	0.145
3	26	3.809	10.241	0.170	0.110	0.416	0.057	0.213	0.121
4	23	3.684	13.201	0.190	0.116	0.366	0.055	0.193	0.101
5	21	4.918	13.886	0.154	0.070	0.317	0.074	0.114	0.103
6	12	5.020	13.989	0.212	0.037	0.242	0.039	0.284	0.109
7	10	9.988	11.006	0.171	0.025	0.150	0.063	0.381	0.117
total	166								
					T-significance of the differences				
1		***	*	*	no	**	***	**	***
2		***	no	no	no	***	no	no	***
3		*	no	no	**	no	no	no	no
4		no	no	no	*	no	no	no	no
5		**	*	*	*	no	*	*	**
6		no	no	no	***	*	no	***	no
7		**	no	no	**	**	no	*	no

For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.

In tables VI.5. and VI.6. we repeated the analysis for state banks and non-state banks. The most interesting observation is that state banks apparently have higher asset utilisation and lower interest margins than other banks. Remarkably, the intermediation margin is lower for state banks across scale classes, with the exception of the two smallest size classes (which together contain only 14 out of 63 state banks)[2]. For all other efficiency variables, the evidence is mixed across size classes. We will need a more sophisticated approach to draw a conclusion.

2.3. Scale effects in Russian banking

The previous section shows that the relation between the bank's type and bank efficiency is distorted by the interference of bank size. In this section we analyse bank production more in detail and try to identify economies of scale in Russian banking.

2.3.1. A model for bank production

Western studies usually consider banks as a multi-product enterprise. For any production, one can estimate a production function, that expresses production as a function of input quantities. The production function captures how the current production technology converts inputs into outputs. There is however a big problem. In the case of banks it is far from clear what are inputs and what are outputs. The problem is mainly situated in the interpretation of deposits. Are these inputs or rather outputs ? The literature considers different approaches.

The absence of a theory that is able to consistently explain all aspects of banking makes the concept of bank production technology a matter of discussion. Consequently there is up till now no consensus in the literature on the definition of bank inputs versus bank outputs. The choice very much depends on the theoretical starting point. Several definitions have been put forward. The difference between the various views in the literature is not always clear. Nevertheless we can distinguish some basic approaches. For a discussion of these approaches see Berger, Hanweck and Humphrey (1987), Clark (1988) and Vander Vennet (1994). Note that the final choice of bank inputs and outputs is not only determined by the implicit theoretical model of bank technology, but also by the research focus and the available data.

Production approach

The production approach interprets banking as a production of loan and deposit accounts and the services offered on these accounts. These services are basically payment settlement in all forms (transfer of funds, payment cheques, phone banking, home banking, debet cards, credit cards etc.), credit in all forms (commercial loans, mortgages, investment credit, credit cards, etc.) and other services. Therefore the basic output variable is the number of accounts managed by the bank. For inputs only operational costs are taken into account, namely labour costs and the cost of physical capital. Interest paid on deposits, nor interest received from granting loans are taken into account.

Value-added approach

This approach builds on the production approach. Both assets and liabilities are considered to have input and output characteristics. The classification as output or input depends on the value added by the item. Assets or liabilities with large value added are considered to be outputs while the converse is true for assets and liabilities with low value added. The value added is operationally defined as the amount of labour and physical input required to produce the asset or liability concerned. This approach was used e.g. by Berger and Humphrey (1992), McAllister and McManus (1993) and others. According to this criterion deposits and loans are the main outputs, while purchased funds and government securities are mostly considered unimportant as outputs. Inputs are typically borrowed funds, fixed assets and labour. Most

authors recognise that saving deposits have characteristics of both outputs and inputs. This has been solved by including the deposit interest cost as an input (see Berger and Humphrey, 1992) or using saving deposits as both inputs and outputs (see McAllister and McManus, 1993). In general the value added approach is subject to interpretation and embodies a mixture of approaches with regard to bank inputs and outputs. It certainly is a very flexible approach.

Intermediation approach or asset approach

The intermediation approach was first used by Sealey and Lindley (1977), who take an opposite stance to the production approach. They consider banks as intermediaries between savings and investments in the economy. As a result earning assets are considered as outputs, while deposits are considered to be inputs. Unlike the production approach all outputs are measured in money and not in numbers. The main difference with the value added approach is the role of deposits. The intermediation approach defines deposits as inputs rather than outputs. Hughes and Mester (1993) devised an empirical procedure to test whether deposits are inputs or rather outputs. They show that deposits should be considered as inputs for bank production.

The choice for an approach was not too difficult in our case. The pure production approach is outdated in empirical research and clearly inappropriate to our work. Moreover we do not have the data required for the production approach. The choice between the value-added approach and the intermediation approach is also straightforward. Since the intermediation of banks is the focal point of our study, it seems logical to apply a variant of the intermediation approach, using loans for bank output and deposits for bank input.

2.3.2. The cost function and scale effects

It is common practice in empirical studies to estimate cost functions instead of production functions, mostly for practical reasons. Total costs (C) are then expressed as a function of n outputs $(Q_1,..., Q_n)$ and m input prices $(P_1,..., P_m)$. For various reasons estimating a cost function is less troublesome than estimating a production function. This is methodologically possible, because neoclassical duality theory showed that every production function is perfectly mirrored by a single cost function if certain regularity constraints are fulfilled. Specifically, the cost function must be non-decreasing, concave and linearly homogeneous in the m input prices (see Brown, Caves and Christensen, 1979).

The functional form of the cost function must be suitable to reflect complex bank technology. Bank technology has some specific attributes, which has consequences for the choice of a functional form. Throughout this work we have been arguing that banks are typically multi-input multi-product firms. The very rationale for the existence of banks as intermediating institutions is to be found in cost complementarities. Banks supply a store of value to savers. Diamond (1984) showed that the optimal contract for savers is to delegate monitoring to the bank and accept in return short term debt with fixed returns (deposits). Banks provide better and cheaper monitoring than the various independent savers could, because they provide diversification of investments. The network of deposit accounts also creates the basic infrastructure for payment settlement. Payment settlement creates additional income for the banks concerned. They can do it cheaper than other payment settlers which would have to create the network of accounts exclusively for the purpose of payment settlement. Also settling payments of clients

gives the bank access to private information on the activities of the agent concerned, which proves to be very useful information in the credit supply process. This inherent multi-product and multi-input character of the bank industry requires flexible functional forms with a minimum of restrictions.

Different functional forms have been proposed in the literature to accommodate this requirement of flexibility. A clear overview of the literature on different functional forms and their ability to model the cost structure of banks can be found in Vander Vennet (1994), and Berger and Mester (1997). All functional forms have explicit pros and cons. We choose to use the translog function proposed by Christensen, Jorgenson and Lau (1973). A recent critique on the use of the translog function for estimating bank cost functions has been formulated by McAllister and McManus (1993). They put forward that the translog function is a local approximation to a true underlying cost function and show that the translog function is subject to misspecification when it is used to represent global behaviour of bank costs. More specifically the translog function imposes a U-shaped cost function, which artificially induces increasing returns to scale for small banks and decreasing returns to scale for larger banks. The optimal scale tends to be near the middle range of the sample studied. The ill-fit of the translog function is also reported by Mitchell and Onvural (1996). In recent years the Fourier-flexible functional form has been proposed, but this form must yet show its superiority over the translog functional form.

The translog function used here is identical to the function applied to European banks by Vander Vennet (1994). Since we have only one output (n=1), the appropriate simplifications are made. The resulting function is shown in (6.1). The required restrictions on the coefficients, due to the requirement of symmetry and linear homogeneity in factor prices, reduce to (6.2).

$$\ln C = \alpha_0 + \alpha_1 \ln Q + \frac{1}{2}\delta ln Q ln Q + \sum_{k=1}^{m} \beta_k \ln P_k + \frac{1}{2}\sum_{k=1}^{m}\sum_{l=1}^{m}\gamma_{kl}\ln P_k \ln P_l + \sum_{k=1}^{m}\theta_k \ln Q \ln P_k + \mu_r \quad (6.1)$$

$$\gamma_{kl} = \gamma_{lk}, \quad \sum_k \beta_k = 1, \quad \sum_k \gamma_{kl} = 0, \quad \sum_k \theta_{ik} = 0 \quad (6.2)$$

If we have an estimate of (6.2), scale effects (SE) are determined as the partial derivative of (6.1) with respect to the single output Q, as indicated in (6.3).

$$SE = \alpha_1 + \delta ln Q + \sum_{k=1}^{m}\theta_k ln Q ln P_k \quad (6.3)$$

2.3.3. Estimation methodology and variables

We estimate (6.1) and (6.2) with the use of the seemingly unrelated regressions technique (see Greene, 1993). In order to reduce the number of free parameters we jointly estimate the cost share equations that express the share of a certain input in total costs. For every input k, the cost share equation is determined by (6.4).

$$S_i = \beta_i + \sum_{i=1}^{m} \gamma_{ik} lnP_k + \theta_i + \mu_i \qquad (6.4)$$

So we jointly estimated (6.1), (6.2) and (6.4) using the seemingly unrelated estimation technique. In order to avoid singularity we had to drop one share equation. We dropped the share equation for the cost of physical capital.

We use three input prices (m = 3), namely the cost of labour (LABOUR), the cost of physical capital (CAPITAL) and the cost of deposits (ID).

The cost of deposits was defined as interest paid, divided by interest-bearing assets. The cost of labour was defined as total labour costs, divided by total assets. The cost of physical capital was defined as costs of rent and depreciation divided by total assets.

We initially wanted to define two outputs, namely loans and securities. However, we were confronted with too many zeros for securities. Therefore we only used one output (as already mentioned) and estimated two versions of the model. In model 1 the variable LOANS equals all loans, including interbank loans. In model 2 LOANS equals all loans plus securities. LOANS in model 2 are always at least equal or higher than LOANS in model 1. Both models are estimated with three samples, namely sample A(1994), subsample Ans(1994) that contains the 76 non-state banks in A(1994), and subsample As(1994) that contains the 50 state banks in A(1994). We hypothesize that the production technology of state banks will differ from the technology of non-state banks and that scale effects are stronger for non-state banks. Results are reported in table VI.7. Then scale effects were calculated according to (6.3.) and reported in table VI.8.

2.3.4. Presentation of results and interpretation

The results strongly suggest that the cost functions of state banks differ from the cost functions of other Russian banks. The most important difference is with respect to the variables that involve LOANS. This has implications for scale effects as can be seen from table VI.8. Note that for state banks we find an inverted U-curve, as shown by the negative coefficient for the quadratic term LOANS² in both models of table VI.7. and the decreasing of the SE-estimates in table VI.8. Apparently scale effects play an increasingly important role for state banks, but the optimal scale is not in sight yet. However we must be cautious with the interpretation of table VI.8. for state banks. Unfortunately the quadratic coefficient that determines the inverted U-shape is insignificant, so in reality their may be no relation at all between costs and scale for state banks. The inverted U-shape may be enforced by the chosen functional form. We must conclude that for state banks there possibly is no relation at all between scale and average cost.

For non-state banks we find a U-shaped cost function, but most banks lie on the upward slope of the curve, well above the optimal scale, as shown in table VI.8. Indeed, out of the 76 non state banks, only 23 banks have an SE <1, which represents positive scale effects. All other non-state banks have negative scale effects.

Table VI.7. Estimation of a cost function for the Russian banking sector

	Model 1			Model 2		
	all	non-state	state	all	non-state	state
CONSTANT	5.7732	7.8847	-1.0106	5.3347	7.94	-0.7072
	(2.499)	(2.568)	(-0.211)	(2.377)	(2.654)	(-0.1608)
LOANS	0.459	0.1919	1.2564	0.4905	0.16	1.214
	(1.712)	(0.5267)	(2.364)	(1.89)	(0.457)	(2.494)
LOANS^2	0.0319	0.0484	-0.0146	0.0307	0.0512	-0.012
	(2.055)	(2.2509)	(-0.4969)	(2.056)	(2.457)	(-0.4508)
ID	0.5065	0.6255	0.4766	0.5605	0.676	0.5117
	(4.729)	(4.4885)	(2.8644)	(5.1696)	(4.766)	(3.0889)
LABOUR	0.454	0.5033	0.3769	0.4607	0.511	0.3788
	(12.425)	(9.6628)	(8.1649)	(12.465)	(9.6634)	(8.1967)
CAPITAL	0.0394	-0.129	0.147	-0.021	-0.188	0.1095
	(0.2747)	(-0.673)	(0.689)	(-0.146)	(-0.965)	(0.516)
ID*CAPITAL	-0.078	-0.0849	-0.0485	-0.0804	-0.086	-0.0524
	(-8.829)	(-7.976)	(-3.448)	(-9.0258)	(-8.058)	(-3.539)
ID*LABOUR	-0.0632	-0.0601	-0.0694	-0.0627	-0.0597	-0.069
	(-15.95)	(-10.953)	(-14.479)	(-15.877)	(-10.969)	(-14.311)
LABOUR*CAPITAL	-0.0131	-0.0129	-0.0098	-0.0134	-0.0134	-0.0095
	(-3.777)	(-2.848)	(-1.954)	(-3.856)	(-2.946)	(-1.876)
DEPIR^2	0.141	0.145	0.118	0.143	0.146	0.121
	(11.032)	(8.988)	(6.25)	(11.13)	(9.042)	(6.183)
LABOUR^2	0.076	0.073	0.079	0.076	0.073	0.079
	(10.265)	(7.283)	(8.072)	(10.241)	(7.314)	(7.925)
CAPITAL^2	0.0912	0.098	0.058	0.094	0.099	0.062
	(7.4041)	(6.442)	(3.055)	(7.572)	(6.528)	(3.114)
LOANS*CAPVAR1	0.0113	0.023	0.0021	0.0145	0.0260	0.0041
	(1.7167)	(2.603)	(0.2148)	(2.186)	(2.9042)	(0.4340)
LOANS*LABOUR	-0.009	-0.0126	-0.00399	-0.0094	-0.013	-0.0042
	(-4.217)	(-3.865)	(-1.6072)	(-4.373)	(-3.9521)	(-1.697)
LOANS*DEPIR	-0.0023	-0.0105	0.002	-0.005	-0.013	0.000076
	(-0.265)	(-0.866)	(0.161)	(-0.584)	(-1.067)	(0.006)
Adjusted R^2 is not reported, but was well above 0.9 for all models						

In fact even the 23 banks with an SE<1 may in fact have an SE>1, since again the U-shaped form is enforced by the translogarithmic functional form. So our hypothesis of different production technologies of state banks and non-state banks cannot be rejected, but our hypothesis that scale effects may explain part of the relation between scale and the interest spread is strongly rejected.

Given the small scale of Russian banks it is very awkward that we find negative economies of scale in Russian banking. It also seems to contradict the findings on cost efficiency in section 2.1. We suspected that this might be due to the definition of our cost function. However, repeating the analysis with transformations of the data or variations in the output definition yielded different cost functions but did not alter the conclusions with respect to scale effects[3].

Table VI.8. Scale effects in Russian banking

Group	Model 1						Model 2					
	all		non-state		state		all		non-state		state	
	SE	#banks	SE	#banks	SE	#banks	SE	#banks	SE	#banks	SE	#banks
1	0,94	15	0,91	14	1,05	1	0,95	15	0,92	14	1,04	1
2	0,98	12	0,99	9	1,04	3	1,00	12	1	9	1,03	3
3	1,01	17	1,02	9	1,02	9	1,02	17	1,04	9	1,02	9
4	1,02	14	1,04	8	1,02	5	1,03	14	1,05	8	1,02	5
5	1,03	16	1,05	12	1,01	4	1,04	16	1,07	12	1,01	4
6	1,05	17	1,09	9	1,00	8	1,06	17	1,11	9	1	8
7	1,07	14	1,11	7	0,99	7	1,08	14	1,13	7	1	7
8	1,10	16	1,18	7	0,98	9	1,12	16	1,20	7	0,99	9
9	1,15	5	1,32	1	0,97	4	1,16	5	1,35	1	0,98	4
Total	126		76		50		126		76		50	

We must keep in mind however that the study is based on data of 1994, with an average age for non-state banks of about two years. It is very well possible that the larger banks were at that time strongly investing in the building of a branch network and were confronted with a number of start-up costs due to rapid expansion. The positive effects of scale on average costs typically become only visible when the situation stabilises and the branch network becomes operational. This is precisely the reason why large state banks do not face these negative economies of scale. State banks are not confronted with the high costs of a quickly expanding branch network, since they inherited their branch network from their communist predecessors. Presumably, in early years the main output of large non-state banks was not loans, but rather branches, financed with the speculative profits that were available to banks in the soft environment of early transition. In section 4 we will analyse some of these alternative profit sources in detail. A second possibility is that banks do not report costs correctly. According to this hypothesis, small banks that are making losses would typically underreport costs in order to show no losses and avoid inspection by the CBR and the tax inspection. Larger banks would overreport their costs in order to decrease their tax liability. Last, our intermediation approach may be ill-fit to the Russian 1994 environment, since banks had simply not engaged in intermediation yet. We suspect that this may be the main explanation for our unexpected result.

3. The interest spread in the Russian commercial banking system

3.1. Introduction

In chapter V, we already revealed how individual banks set interest spreads. In section 1 of this chapter, we observed that average spreads were high throughout 1992-1994. Large interest spreads are inefficient because they hamper the genuine functioning of banks as intermediaries between sources of funds and investment. If interest spreads are too high, many normally profitable investments will not be financed and the economy will allocate capital inefficiently. In section 1 we also revealed the relation between the bank's type and the interest spread. Still the role of scale was not very clear. In section 2 we analysed the role of scale effects, and we could reject the hypothesis of economies of scale. In this section we look for systemic factors that explain high interest spreads. We develop a rough model that captures the systemic determinants of high interest spread. The basic idea is equivalent to Dittus (1994).

3.2. The model

Based on some accounting identities, we develop a simple model to analyse the influence of different factors on the interest spread (s). We start from the model of chapter V, section 4.4. The structure of a bank's balance is (all variables in % of assets):

Good loans (GL)	Charter capital + reserves (CAP)
Bad loans (BL)	Deposits (D)
Excess reserves (ER)	Centralised credit resources (CCR)
Treasury bills (GKO)	
Required reserves (RR = r*D)	

$\sum$ = Total assets (A) = 1 $\sum$ = Total liabilities (L) = 1

Define :
POA   = profit / A,
OC   = operating costs/A,
OI   = net income from other sources than interest income[4]/A,
ROE   = return on equity = POA / CAP,
π = inflation.   (6.5)

Then we can formulate the profit function as follows :
POA = (il*GL) + (igko*GKO) + (ir*r*D) - (id*D) - (iccr*CCR) + (OI-OC)   (6.6)

with il, igko, ir, id and iccr representing the loan rate, the interest on treasury bills, the interest rate on required reserves with the CBR, the deposit rate and the interest on CCR.

Express igko as a function of il and iccr and ir as a function of id :
igko   = s1 * il,
iccr   = s2 * id,
ir   = s3 * id,   (6.7)

with   s1 > 1 indicating soft subsidies to the banking sector,
              s2 < 1 indicating soft monetary policy,
and   s3 < 1 indicating financial repression.

This parametrisation of interest rates allows us to run alternative scenarios, which is impossible with the Ditttus (1994)-model.

Substituting, (6.7) in (6.6) yields :
POA = (il*GL) + (s1*il*GKO) + (s3*id*r*D) - (id*D) - (s2*id*CCR) + (OI-OC)   (6.8)

We define the following identities:
il   = id + s,
RROE   = real return on equity
                      = ((1+ROE)/(1+π))-1,
id   = rid + π(1+rid),   (6.9)

with rid denoting the real deposit rate.

We assume that banks have to respect a certain minimal level of RROE, in order to survive in the long run. This restriction provides a minimum constraint for the interest spread.

Substituting the definitions of (6.5), and the identities of (6.9) in (6.8), solving for s, and some rearranging, yields:

$$
s = \frac{CAP[\pi+RROE(1+\pi)] - [(rid +\pi(1+rid))[CAP(1+r(1-s3)) +CCR\,(1-s2+r(1-s3)) -GKO(1-s1) -ER -BL -r(1-s3)]] -[OI-OC]}{(1 - GKO(1-s1) - ER - BL - r + r\,CAP + r\,CCR)} \qquad (6.10)
$$

If we use (6.10) to simulate the effects of exogenous changes in certain variables, one tricky problem remains. For example, if we simulate s according to (6.10) but with a higher efficiency of the payment system (expressed as a lower ER), (6.10) is defined so that all efficiency gains of lower ER will go into higher GL (which is the implicit remainder). This means an implicit amelioration of loan quality. It is obvious that one expects that a proportion of the new loans issued with the resources of lower ER will turn out to perform badly. Note that this was one of the main defects in the Dittus (1994)-model. We can easily solve this problem by redefining BL.

Consider the loan quality :
$$Lq = GL/TL$$

We can define total loans issued :
$$BL + GL = TL$$
$$= 1-GKO-ER-r+r*CAP+r*CCR$$

Multiplying both sides by (1-Lq) yields
$$BL = (1-GKO-ER-r+r*CAP+r*CCR)*(1-Lq) \qquad (6.11)$$

We use (6.11) to determine BL, given Lq and all other variables. The advantage of this definition of BL, is that implicit changes in the loan quality are excluded. As a matter of fact BL is replaced by Lq as an independent variable. BL is fully determined by the other parameters of the model. Substituting (6.11) in (6.10) yields :

$$
s = \frac{CAP[\pi+RROE(1+\pi)] - [(rid +\pi(1+rid)) [CAP(1+r(Lq-s3)) +CCR(1-s2+r(Lq-s3)) -GKO(Lq-s1) -(ER\,Lq) -(1-Lq+r(Lq-s3))]] -[OI-OC]}{(Lq - GKO(Lq-s1) - ER\,Lq - (1- CAP - CCR)\,r\,Lq)}
$$
$$(6.12)$$

3.3. Interpretation of the model

From chapter V, we know that there is a relation between the interest spread and the quality of the loan portfolio and loan demand. However, this relation may be temporary. It may depend on the specific Russian environment in 1992-1994 and can therefore not be used to analyse the influence of certain scenarios on the interest spread. Expression (6.12) however does not assume any relation between the spread and the variables included. As a matter of fact, we have in (6.12) rearranged some accounting identities as a function of the interest spread on the

basis of the single assumption that banks have to satisfy the restriction of a minimal RROE. Therefore our model and its simulations are not subject to the Lucas-critique.

Still (6.12) is very useful. We can determine the influence of any variable on the interest spread by determining the sign of partial derivatives of (6.12) with respect to the variable concerned. We do this below for some of the most interesting variables :

- $\partial s/\partial s1 < 0$ in all cases, which indicates that lower interest on GKO would raise interest spreads on credits to the economy and vice versa.

- $\partial s/\partial s2 > 0$ in all cases, which indicates that harder monetary policies will increase spreads and vice versa.

- $\partial s/\partial s3 < 0$ in all cases, which indicates that financial repression always causes higher spreads.

- Using the quotient rule one can easily verify that $\partial s/\partial r$ is positive for $s3 < Lq$ and negative for $s3 > Lq$. If financial repression is severe enough (characterised by $s3 < Lq$), increases in the reserve requirement lead to an increase in the interest spread. However if the loan quality Lq is bad enough and financial repression is soft enough ($Lq < s3$), higher required reserves may actually decrease the interest spread. This is not very likely in Russia, since financial repression is particularly hard there ($s3 = 0$), but it is an interesting theoretical result.

- $\partial s/\partial Lq < 0$ in all cases. Exogenous shocks to systemic loan quality (lower Lq) cause higher interest spreads. In chapter V we already found that high spreads have adverse selection properties and decrease loan quality. Combining these two findings, we see that in the Russian environment of 1992-1994 the strong exogenous shock of transition to loan quality may have started a vicious circle of higher spreads and worse loan quality. The dynamics of this circle presumably dampen with time. It is important to understand that exogenous shocks in loan quality may have a multiplicator effect on spreads and loan quality. The multiplicator presumably works both ways. A positive exogenous shock in loan quality would decrease spreads, which would by itself further increase loan quality and so on.

- $\partial s/\partial ER > 0$ in all cases. If the zero interest liquidity holdings of banks rise, interest spreads will have to rise too in order to satisfy the RROE-constraint.

- $\partial s/\partial \pi > 0$ in all cases. Higher inflation always urges banks to increase interest spreads.

- Assuming that $s3 < Lq$ (which is the case in Russia), $\partial s/\partial CCR > 0$ if monetary policy is hard enough, as expressed by $s2 > 1 + r(Lq - s3)$. If monetary policy is too soft in the refinance rate ($s2 < 1 + r(Lq - s3)$), higher CCR-dependence of banks would in fact decrease the spread. On the other hand this soft policy would increase inflation and thus the spread so that the net effect on the spread is unclear.

- $\partial s/\partial GKO < 0$ if $Lq < s1$. If the yield on GKO is sufficiently high, given the loan quality, higher GKO-emission is an implicit subsidy to the banking system and will decrease the spread on loans to the economy. This has actually happened in Russia in 1995-1996.

3.4. Simulations of the interest spread

3.4.1. The benchmark

The independent variables in (6.12) are CAP, π, RROE, rid, CAP, r, s3, CCR, s2, GKO, s1, Lq, ER, OI, OC. The annual inflation was based on RET-data (200%). CAP and rid were

estimated as the weighted averages of B(1994)-data. This delivered about 0.1 for CAP and 0.9 for id. Combining the values for ID and π, according to (6.9), gives -0.367 for rid. The estimates for id and idr are low, but this was already explained in chapter III. The other variables required more detail of the data base and were derived from A(1994)-data. This was the case for r, ER, GKO, OI and OC. Their weighted averages were respectively 0.133, 0.063, 0.037, 0.06 and 0.06. For Lq we chose not to use the understating estimates from sample A(1994), but the more realistic data from Goskomstat (see chapter VII). This delivered a reasonable Lq of 0.85. Estimating CCR was troublesome because Russian bank accounting has only one account that captures both CCR and interbank credits. We used sample A(1994) to find a weighted average of 0.335 for the sum of CCR and interbank credits. From the CBR we know that CCR were about 60% of interbank credits during 1994 (see chapter III, table III.19, column 1). This means that CCR were about 37.5% of the sum of CCR and interbank credits, which yields a value of 0.126 for CCR as a % of assets. The value for s1, s2 and s3 requires data on the average yield of the GKO-rate, the refinance yield and the interest paid on required reserves by the CBR. The average yield on riskless GKO in 1994 was estimated as the weighted average of the yields in 1994 (see chapter V, section 3) and was about 250%, which is 50% above inflation. S1 was set at 1.5, which is prudent. The refinance yield for 1994 was calculated as the compounded yield of 12 monthly refinance rates and was at about 400% (see chapter V, section 4). With an ID of 90%, s2 = 4.44. Since we know that at least some of the refinance credits were not redeemed, we set s2 = 4 as a more realistic value. Since required reserves pay no interest in Russia, s3 is equal to zero. Together, this delivered the basic dataset of table VI.9. :

Table VI.9. Basic data for spread simulations

π	= 2
CAP	= 0.1
rid	= - 0.367
r	= - 0.133
ER	= 0.063
GKO	= 0.037
OI	= 0.06
OC	= 0.06
Lq	= 0.85
CCR	= 0.126
s1	= 1.5
s2	= 4
s3	= 0

These data yield a reasonable benchmark spread of 96.2 %, as shown in the upper left cell of table VI.11.

3.4.2. The scenarios

Starting from this basic data-matrix we can study the contribution of the various variables to the spread, by changing their value, calculating the new spread and expressing the difference as a % of the benchmark spread. Concretely, we proposed the scenarios presented in table VI.10. We run various combinations of these scenarios and present results in the form of matrices.

Table VI.11. shows the simulated spreads and table VI.12. compares spreads to a benchmark.

Table VI.10. List and description of simulated scenarios

No.	Value of variables	Description
1	s1 = 1	No implicit subsidisation of banks by the government.
2	s2 = 1	Softer monetary policy.
3	s3 = 1	No financial repression in the form of required reserves.
4	r = 0	No required reservation.
5	Lq = 1	No systemic problems with loan quality.
6	ER = 0	No inefficiency in the payment system and liquidity management.
7	CCR = 0	No dependence on the CBR for funding.
8	π = 0	No inflation.
9	idr = 0	Non-negative real interest rates.
10	OI = 0	No lucrative deals substituting for intermediation income.
11	CAP = 0.2	Capitalisation is increased to compensate systemic bad loan quality.
12	RROE = 0.12	Return on equity is set to normal market levels.
13	idr = 0.1 and CCR = 0	Stabilisation scenario no.1. The real deposit rate becomes positive. Banks' dependence on CCR goes to zero. Note that CCR = 0 implies that s2 has no effect.
14	13 and 8	Stabilisation scenario no.2

3.4.3. Presentation of results and interpretation

In table VI.11. we show the spreads according to several combinations of scenarios. The spreads are expressed in decimals. Thus the benchmark spread of 0.962 in the upper left cell, stands for a spread of 96.2% The results are presented in matrix-form. Logically this matrix is symmetric. The diagonal elements equal the elements in the corresponding base row and base column. In table VI.12. we show the contributions of the various elements to the spread. The table is based on table VI.11.: Every element of table VI.12. was calculated as the % difference between element in the base column of the corresponding row of table VI.11. And the corresponding element in table VI.11. As a consequence, positive signs signal a positive contribution to the spread and negative signs indicate a negative contribution to it. The first row is filled with zeros, the diagonal elements are all zero and the matrix is not symmetric. Element (9,13), (9,14) and their symmetric elements could not be calculated because of contradictory conditions.

In both tables there is an amazing amount of information. We give some of the most important observations.

From the base row of table VI.12. we know that the combination of bank dependence on CCR and hard monetary policy substantially contributed to high intermediation spreads, as seen from elements (base,2) and (base,7). This also reveals that the softness of the CBR with respect to commercial banks is not in its low interest rates, but in the high availability of credit for commercial banks. This is equivalent to our earlier conclusion on the softness of former state banks with respect to corporate customers. Inflation had off course also a substantial impact (see (base,8) and (base,14) for proof).

Table VI.11. Simulated spreads

	base	1	2	3	4	5	6	7	8	9	10	11	12	13	14
base	0.962	1.010	0.499	0.836	0.763	0.701	0.835	0.527	0.676	1.780	1.044	1.102	0.991	0.881	0.032
1	1.010	1.010	0.535	0.880	0.802	0.736	0.877	0.565	0.716	1.877	1.094	1.153	1.040	0.965	0.036
2	0.499	0.535	0.499	0.373	0.350	0.303	0.404	0.527	0.213	0.751	0.581	0.646	0.528	0.881	0.032
3	0.836	0.880	0.373	0.836	0.763	0.592	0.717	0.377	0.692	1.499	0.918	0.994	0.864	0.498	0.016
4	0.763	0.802	0.350	0.763	0.763	0.528	0.661	0.350	0.507	1.376	0.837	0.916	0.789	0.486	0.016
5	0.701	0.736	0.303	0.592	0.528	0.701	0.590	0.327	0.455	1.250	0.772	0.821	0.726	0.436	0.014
6	0.835	0.877	0.404	0.717	0.661	0.590	0.835	0.428	0.568	1.522	0.911	0.967	0.862	0.660	0.023
7	0.527	0.565	0.527	0.377	0.350	0.327	0.428	0.527	0.235	0.805	0.611	0.676	0.556	0.881	0.032
8	0.676	0.716	0.213	0.549	0.507	0.455	0.568	0.235	0.676	0.007	0.758	0.538	0.685	0.032	0.032
9	1.780	1.877	0.751	1.499	1.376	1.250	1.522	0.805	0.007	1.780	1.862	1.743	1.809	na	na
10	1.044	1.094	0.581	0.918	0.837	0.772	0.911	0.611	0.758	1.862	1.044	1.183	1.073	0.965	0.116
11	1.102	1.153	0.646	0.994	0.916	0.821	0.967	0.676	0.538	1.743	1.183	1.102	1.159	0.812	0.023
12	0.991	1.040	0.528	0.864	0.789	0.726	0.862	0.556	0.685	1.809	1.073	1.159	0.991	0.911	0.042
13	0.881	0.965	0.881	0.498	0.486	0.436	0.660	0.881	0.032	na	0.965	0.812	0.911	0.881	0.032
14	0.032	0.036	0.032	0.016	0.016	0.014	0.023	0.032	0.032	na	0.116	0.023	0.042	0.032	0.032

Table VI.12. Contribution to the spread of several factors

	base	1	2	3	4	5	6	7	8	9	10	11	12	13	14
base	0	-0.050	0.481	0.132	0.207	0.271	0.132	0.452	0.298	-0.849	-0.085	-0.145	-0.030	0.084	0.916
1	0	0	0.47	0.129	0.207	0.271	0.132	0.441	0.291	-0.858	-0.083	-0.141	-0.029	0.045	-0.108
2	0	-0.072	0	0.254	0.299	0.393	0.192	-0.055	0.574	-0.504	-0.164	-0.294	-0.057	-0.765	0
3	0	-0.053	0.554	0	0.087	0.291	0.142	0.549	0.172	-0.793	-0.098	-0.189	-0.034	0.405	0.517
4	0	-0.050	0.542	0	0	0.308	0.134	0.542	0.335	-0.803	-0.096	-0.200	-0.034	0.363	0.509
5	0	-0.050	0.568	0.155	0.247	0	0.158	0.533	0.352	-0.782	-0.100	-0.171	-0.035	0.379	0.574
6	0	-0.050	0.517	0.141	0.208	0.293	0	0.488	0.320	-0.822	-0.091	-0.158	-0.032	0.210	0.286
7	0	-0.071	0.000	0.285	0.336	0.379	0.189	0	0.555	-0.528	-0.158	-0.283	-0.055	-0.672	0
8	0	-0.060	0.685	0.187	0.249	0.327	0.160	0.653	0	0.990	-0.121	0.205	-0.014	0.952	0
9	0	-0.055	0.578	0.158	0.227	0.298	0.145	0.548	0.996	0	-0.046	0.021	-0.016	na	na
10	0	-0.048	0.443	0.121	0.199	0.261	0.127	0.415	0.275	-0.783	0	-0.133	-0.027	0.076	-2.589
11	0	-0.046	0.414	0.099	0.169	0.255	0.123	0.386	0.512	-0.581	-0.073	0	-0.051	0.264	0.276
12	0	-0.049	0.467	0.128	0.204	0.268	0.131	0.439	0.309	-0.825	-0.083	-0.169	0	0.081	-0.302
13	0	-0.095	0	0.435	0.448	0.506	0.251	0	0.963	na	-0.095	0.079	-0.033	0	0
14	0	-0.108	0	0.517	0.509	0.574	0.286	0	0	na	-2.589	0.276	-0.302	0	0

Next, some elements had a negative contribution to the spread in all scenarios. Indeed, high GKO-return, negative real interest rate, high income from other sources, low capitalisation and low required return on equity in fact tempered the spread as seen by the negative signs in columns 1, 9, 10, 11 and 12. In 1994, the most important factor seems to be the negative real interest rates in 1994. If interest rates would not have been negative, spreads would have been much higher, as shown by the negative signs in column 9.

But column 8 is overstating the impact of higher real deposit rates on the spread. It is clear that, in the case of positive real deposit rates, bank's dependency on CCR would decrease, which has a positive effect on the spread, as long as monetary policy is hard. That can be seen from column 13 in table VI.12., which supposes that high real deposit rates indeed decrease bank's CCR dependence (idr = 0.1; CCR=0). We see that now the signs become positive, indicating that the higher idr, combined with a zero CCR would actually decrease the spread. This is however only the case if monetary policy is hard. If monetary policy is soft in the refinance rate (as in 1992-1993), then a positive real interest and lower CCR dependence would actually increase the spread as shown by the negative sign of cell (2,13) in table VI.12. The influence of required reservation seems to be moderate at 20.7% in element (base,4). This

first impression is due to the high dependence of banks on expensive CCR. In rows 7, 13 and 14, CCR is set at zero and we see that the contribution of required reserves rises accordingly, as shown in rows 3 and 4. We also note that the contribution of required reserves to larger spreads is largely due to the financial repression (or inflation taxation) aspect of required reservation. If we leave r unchanged, but set s3 to 1 (no financial repression) a lot of the contribution of r to the spread is undone. This can be seen by comparing rows 3 and 4 in both tables. The net effect of r, without financial repression, equals the difference of both columns, which is little for all rows.

Loan quality affects spreads slightly stronger than required reservation, as seen from column 5. If we have underestimated the problem of bad loans in the basic dataset, the contribution of loan quality to spreads would be higher. Note also that, ceteris paribus, the contribution of loan quality becomes much stronger in the case of stabilisation (rows 13 and 14). Additionally we can expect the problem of loan quality to become worse in the initial phase of stabilisation (see chapter VII). Therefore, bad loan quality may have become one of the main stumbling blocks to achieve low spreads in recent years.

Row 14 gives us a stabilisation scenario that may well realise in 1998. The base column of table VI.11. gives an interest spread of 3.2%. Some factors that were not very important before come to the foreground. Required reserves contribute much more to the spread. Also the systemic loan quality becomes much more important. A spread of 3.2% may be an underestimation, because some of the factors that temper the spread may fade out together with stabilisation. For example, it seems likely that the easy profits from other sources (currency exchange and speculation, real estate, interbank credits, payment fees etc.) would crumble along with stabilisation. In effect, losing other income sources would increase the spread with more than 250% as observed in (14,10), table VI.12. Rising capital requirements and rising ROE requirements, that also come along with stabilisation, even reinforce this tendency. Therefore Russia may be facing spreads well above 10% in the future, if it cannot solve the problem of the bad quality of loans and if financial repression is maintained.

4. Profit contribution of some important sources

Intermediation is not the only source of income. This was very much the case in Russia in 1992-1994. In chapter IV we found that revenues from payment settlement may have been substantial. In section 2 of this chapter we found no economies of scale, presumably because large banks are drawing on other revenue sources than regular bank intermediation. In section 3 of this chapter, we found that in the case of stabilisation, these other income sources become centrally important to banks' profitability and to the interest spread. If this flow of revenue dries up completely, spreads may increase with 250%, because the alternative sources of funds have actually been tempering spreads. In this section we analyse some alternative income sources in detail. Specifically we turn our attention to GKO, currency exchange, payment settlement and interbank operations, because we have bank-based data on these income sources. Other factors will also have played a role. One of these may be arbitrage. We have already at several occasions seen that there exist large regional price differences on financial markets. This not only holds for interest rates, but also for exchange rates, inflation and so on. Banks operating on several regional markets could exploit these differences and make easy money. This cannot be tested however because of the lack of data.

4.1. The contribution of currency speculation

We already showed that banks played a very active role in the dollarisation of the economy. In fact the first financial market that functioned properly in Russia was the Moscow Interbank Currency Exchange (MICEX). Note also that MICEX is not the only currency exchange in the country. Actually by end 1994 there were -next to the central MICEX- 7 other important currency exchanges operating in the Russian regions[5]. Currency transactions are important for bank profitability. There were two major sources of currency income, namely intermediation income from selling currency to and buying currency from customers and income from exchange rate differences, mainly speculation income. The Russian accounting system does not provide information on income for currency exchange[6], but it does provide information on income from exchange rate differentials (ERD). For sample A(1994) we have data on net ERD income and also information about to which extent this revenue is realised or not[7]. Indeed, some of the ERD income is not realised and thus virtual. In order to assess the importance of this exchange rate income, we compare it with the total profit and with interest income. The results are shown in table VI.13.

Table VI.13. The profit contribution of currency speculation in 1994

	Weighted averages[8]		Simple averages[9]
	Sample A	Subsample A*	
	(126 banks)	(103 banks with non-zero ERD income)	
	(1)	(2)	(3)
total ERD income as % of			
-net interest income	15.4%	16.5%	66.2%
-profit	16.6%	17.5%	102.7%
realised ERD income as % of			
-net interest income	4.7%	5.0%	109.3%
-profit	5.0%	5.3%	86.4%
virtual ERD income as % of			
-net interest income	10.7%	11.5%	-43.2%
-profit	11.6%	12.2%	16.3%
virtual ERD / total ERD	30.3%	idem	na[10]

Column (1) shows that for the banking sector as a whole ERD income is quite important. It amounts to 15.4% of net interest income and contributes for 16.6% to profit. However 30.3% of this ERD income was not realised by end 1994. In column (2) we repeated the calculations for subsample A* (sample A, with the exclusion of 23 banks that reported zero ERD income). The numbers of (2) are only marginally higher than these of (1), which indicates that the weight of the excluded banks in the calculation of (1) must have been small, or in other words that the excluded banks are small banks. If banks do not show interest rate differentials, they tend to be small. Column (3) deviates seriously from (1) and (2). In (3) we calculated the ratios for every bank in subsample A* and then took unweighted averages. The influence of smaller banks is thus much higher than in (1) or (2). ERD income is now significantly higher. This indicates that for small banks that are involved in currency operations, ERD is a major source of income. Total ERD was 43.3% of net interest income and more than 100% of profits. Since the main operating costs (personnel, branch network) should largely be attributed to net

interest income, 66.2% is remarkably high. This is indeed illustrated by the fact that ERD income was more than 100% of profit in (3). This means that without this ERD income, at least some banks would have suffered losses. Moreover, realised ERD is more than 86% of profits, which means that the income was mainly derived from actively buying and selling currency, and not from open positions. The last two numbers of (3) are a bit of a mystery. One must however be very cautious with inferences from (3) because standard deviations are high. Indeed, analytical scrutiny shows that results are influenced by a small number of outliers. To support correct interpretation of table VI.13. we show the distribution of banks in subsample A* according to the contribution of ERD income to profits in table VI.14.

Table VI.14. Sample distribution of A* according to ERD contribution to profit

Contribution of ERD income in % of profit	Number of banks satisfying the conditions in the first column			
	absolutely	in % of A*	increase	increase in % of A*
> 100%	11	10.7%	11	10.7%
> 75%	12	11.7%	1	1.0%
> 50%	16	15.5%	4	3.9%
> 25%	28	27.2%	12	11.7%
> 20%	34	33.0%	6	5.8%
> 15%	38	36.9%	4	3.9%
> 10%	45	43.7%	7	6.8%
> 5%	66	64.1%	21	20.4%
> 1%	89	86.4%	23	22.3%
> 0%	103	100.0 %	14	13.6%

The more detailed information of table VI.14. allows us to complete the picture. Some banks are indeed largely dependent on ERD income. 15.5% of banks in A* is completely dependent on ERD income (more than 50%). Exactly one third of banks in A* is more than 20% dependent on ERD. However, the majority of banks (56.3%) is less than 10% dependent on ERD for profit. Add to this that in A* we excluded 23 banks that report no ERD income at all. Simple manipulation learns that in sample A only 12.7% is more than 50% dependent on ERD for profit, while 64.3% of A are less than 10% dependent. Further analysis of the 12.7% of ERD-dependent banks did not release any information : The frequency of respectively Moscow-based banks, state banks, and national or regional banks in the ERD-dependent class was not significantly different from their frequency in the complete sample.

Therefore we may summarise the conclusions as follows : 1) ERD income is considerable for the banking sector as a whole, but is dominated by net interest income. 2) Some smaller banks have no currency income at all, presumably because they do not have a licence. 3) For a small number of banks with a licence (12.7%), ERD income is an important contributor to profit. Apparently, actively trading currency is one of the main activities of these banks. Given their dependence of profitability on income from currency trading, one can question the chances of survival of these banks in case of stabilisation. 4) These ERD-dependent banks cannot be distinguished from other banks by type information.

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4.2. Other sources of bank income approached empirically

4.2.1. Theory

In section 3 we used the variable OI to measure other sources of bank income. Here, we identify some of these sources and analyse their relation with bank profitability. The first income source is income from currency speculation, as measured in the previous section. A second determinant is income from payment settlement, as argued at length in chapter IV. A third source is income from state bonds (mainly GKO), as argued in chapter V and in section 3 of this chapter. A fourth source of income is net lending on the interbank market, as argued in chapter V.

Note however, that payment settlement is not only valuable for banks because of inflation tax revenue (as argued already in chapter IV). We want to stress that also a lot of banks' informational advantages stem from the fact that the banks manage the payments of their possible borrowers. This is distinctively the case in Russia. Transition rendered the existing information base close to useless and the subsequent instability prohibited the building of new information. Most banks are only just emerging and cannot draw information from long term relations with customers (see chapter V). Even the former state banks suffer from this problem. Their long term relations with former state enterprises lose importance and relevance. Transition and privatisation changed the nature of most of these enterprises. Therefore one of the important sources to get information about possible borrowers is precisely payment settlement. The fact that an enterprise pays its bills on time and receives regular payments from its customers reveals far more about its solvency than official accounts of such enterprises. It is normal that banks can only engage in delegated monitoring after having established good contacts with customers and getting access to information about these customers from their payment flows and currency exchange activities. Therefore efficient lending to enterprises is strongly facilitated by payment settlement for the enterprises concerned. Payment settlement has positive external effects on loan quality.

4.2.2. Data, variables and methodology

The empirical problem is how to measure the various income sources. If we use data from the income and loss statements, we would find a perfect correlation since profit is a linear combination of the different profit contributions. Therefore we will approximate most variables with asset data. The exception is income from currency speculation. Since we have no reliable asset data to measure the level of currency speculation, income from currency speculation is measured directly by ERD, as defined in the previous section. The income from payment settlement is measured by the share of current accounts of enterprises in total assets (CATA), as was done in section 2 of chapter V. Here we have a risk of misspecification. In section 4 of chapter V we found that the deposit rate is negatively related to CATA. Therefore, if CATA shows a positive sign in the profit regression, it might be due to the deposit rate effect of CATA. The income from state bonds is measured by dividing state bonds by total assets. The income from interbank lending is measured by net interbank lending (interbank assets minus interbank liabilities) divided by total assets. As a controlling variable we use the interest spread. The advantage of using the spread as a dependent variable is that the deposit effect of CATA is already in the spread and therefore CATA will only measure payment settlement income.

We estimated an OLS on A(1994), with POA (profits / total assets) as dependent variable and as independent variables :

- currency speculation

    ERD   =   net income from currency speculation / (net interest income + net income from currency speculation)

- state bonds

    SBA =   state bonds / total assets

- payment settlement

    CATA   =   current accounts of enterprises / total assets

- net interbank lending

    IBNET =   (interbank assets - interbank liabilities) / total assets

- controlling variables

    S   =   interest spread

    RESA =   reserves / total assets

For all variables we expect positive signs, because they are all defined as positive contributions to profit. Note that the positive sign for IBNET is not straightforward. Its expected positive sign follows from the theoretical reasoning in section 5 of chapter V, where we argue that banks considered interbank credits to be a riskless and profitable investment in 1994. However, if we look at the empirical definition of IBNET, we observe that interbank liabilities are subtracted in the numerator. From chapter III, we know that these interbank liabilities to a large extent contain CCR. If the monetary policy was soft in the refinance rate in 1994, then the coefficient should be negative : A lower IBNET mirrors higher CCR, which means higher profit and lower spreads in the case of softness in the refinance rate (see section 3). If we find a positive coefficient, that would be another indication that monetary policy was hard in the refinance rate during 1994, as pointed out in section 3 of this chapter. If we find a negative coefficient, we have contradictory findings.

Results are reported in table VI.15. In equation No. 1 we exclude the controlling variables, in equation No. 2 we include S and in equation No. 3 we include RESA in order to look at stickiness of bank profitability.

In equation No. 1 we see that all variables are significant and explain about 35% of the variation. However, ERD shows an unexpected negative sign. Apparently banks with high income from currency speculation are not very profitable. Possibly they try to compensate low profitability with highly risky speculation income. This gives an interpretation of the finding in section 4.1. of this chapter that a small number of banks is very dependent on ERD-income. Apparently, this group of ERD-dependent banks is not very profitable. This supports the hypothesis that these banks will have got into serious trouble with the stabilisation of the exchange rate in July 1995. Adding the controlling variables in equation No. 2 and No. 3, increases explanatory power to 56%. The relationship between the spread and profitability is positive and significant, as expected.

Also RESA performs remarkably well, which shows that current bank profitability is very well predicted by bank profitability and dividend policy of the past. The significance of ERD, S and RESA was to be expected, since the calculation of the variables is based on, or closely linked to profit and loss data.

4.2.3. Presentation of results and interpretation

Table VI.15. Alternative profit sources of Russian banks

Dependent variable is POA, sample A(1994), 126 banks			
Equation No.	1	2	3
C	0.037 ***	0.037 ***	0.017
	(3.3; 0.001)	(3.047; 0.003)	(1.516; 0.132)
ERD	- 0.042 **	-0.037 *	-0.030 *
	(-2.23; 0.028)	(-1.863; 0.065)	(-1.892; 0.072)
SBA	0.292 **	0.216 *	0.049
	(2.5; 0.014)	(1.707; 0.09)	(0.545; 0.587)
CATA	0.199 ***	0.111 *	0.116 **
	(3.948; 0.000)	(1.798; 0.075)	(2.14; 0.034)
IBNET	0.084 **	0.09 **	0.061
	(2.135; 0.035)	(2.020; 0.046)	(1.499; 0.136)
S		0.098 ***	0.0745 ***
		(4.477; 0.000)	(3.635; 0.000)
RESA			3.460***
			(5.372; 0.000)
Adjusted R^2	0.345	0.456	0.56
F-statistic	15.953	20.13	25.192

White heteroskedasticity-consistent standard errors & covariance
For all results *** is 1%-significance, ** is 5%-significance and * is 10%-significance.
T-statistics and t-probability are in brackets

.

Note however, that also CATA is significant across specifications, while it does not have any direct relation with profit and loss data. Apparently payment settlement was a very important source of bank profitability in 1994. This source will not necessarily dry up completely with stabilisation. Lower inflation will indeed decrease the income from inflation taxation but it will also increase the monetisation of the economy. As a consequence, payments will be settled to an increasing extent by means of bank transfers in substitution for cash or barter, which increases the volume of payments. Also information drawn from payment settlement will become more useful to banks, since enterprise information will remain scarce in the short run and remonetisation will increase the volume of bank credits to the economy.

Notes of chapter VI

1. The spreads were calculated as commercial banks' loan rates reported by the CBR (Tekushie Tendentsii v Denezhno-Kreditnoi Sfere) minus the deposit rate of Sberbank on time deposits with maturity of 1 year. The index of credits of commercial banks to the economy in real terms was calculated with CBR-data on bank credit to the economy and with the inflation data reported by the CBR (Tekushie Tendentsii v Denezhno-Kreditnoi Sfere).

2. This again supports the finding that state banks have higher spreads and not lower spreads as generally received.

3. We did transform the data by subtracting from every data point the corresponding sample average. Conclusions with respect to scale effects were identical. We also added a second output, namely the number of branches. The general fit was worse, but the conclusion with respect to scale effects was equivalent.

4. Specifically, other income contains income from currency exchange, trading of shares and securities, real estate, fees and commissions, payment settlement, arbitrage between regional price differences and so on.

5. In its publication Tekushie Tendentsii v Denezhno-Kreditnoi Sfere, the CBR reports the quotations of 8 currency exchanges, including MICEX and 7 regional currency exchanges.

6. In the Russian bank accounting system, profit and loss statements only contain one revenue account that captures revenue from currency exchange and security trading and one cost account for expenditure on currency exchange and security trading. The net contribution of both cannot be separated. We calculated the net income from currency exchange and security trading (the difference between the income account and the cost account) and divided by total profits. The average contribution to profit was 14.8% and the weighted average 14.7%. The standard deviation however was very large.

7. According to publication form No. 2, the banks have to provide detailed information on their revenues (account No. 96) and their costs (account No. 97). Code 112 captures income from exchange rate differentials and code 207 captures costs from exchange rate differentials. By subtracting code 207 from code 112 we find the net income from exchange rate differentials. Note that a part of the net income or loss is only virtual as indicated by the banks on a questionnaire added to publication form No. 2.

8. We summed net interest income, total ERD income, realised ERD income, virtual ERD income and profit for all banks in sample A (column (1)) and sample A* (column (2)). Then we made the divisions indicated in the table. The result is a weighted average for respectively sample A and sample A*.

9. For every bank in subsample A*, we divided total ERD income, realised ERD income and virtual ERD income, by respectively profit and net interest income. This delivers negative numbers in the case of an ERD loss. In a small number of cases the net interest income or profit was negative. In those cases a positive ERD income results in a negative ratio because the denominator is negative. The reverse holds for a negative ERD income. We solved this

problem by simply changing the sign in the case of negative profit or net interest income. In any case the number of negative denominators was so small that the influence on the calculations in column (3) was only of marginal importance.

10. This could not be calculated because in both categories (realised ERD and not realised ERD) there were a considerable number of zeros.

Chapter VII. The role of banks in corporate governance

0. Overview

In section 1 we review some of the literature on corporate governance and try to define whether Russian banks should be involved in corporate control or not. Section 2 addresses the problem of creditor inactivity in Russia. Experience has shown that Russian banks behave rather passively with respect to bad loans. Instead of enforcing bad loans, they seem to have a 'wait and see' -approach. In practice, bad loans are often rescheduled or rolled over into a new loan. We provide a theoretical framework that explains creditor inactivity as rational behaviour. We use the model to provide some estimates on the optimal period of waiting and the value of waiting. In section 3 we study the involvement of banks in corporate governance through direct ownership of enterprises. Banks have become enterprise owners by setting up own businesses, participating in the process of privatisation and acquiring enterprises from the initial owners after privatisation. Section 4 analyses the emergence of financial-industrial groups in Russia and their influence on the relationship between banks and the economy. The chapter leads to several findings :

- Theoretically we expect that Russia's system of corporate control will be rather bank-based than market-based.
- In practice, banks have been very passive with respect to corporate governance.
- This passivity can be explained in a theoretical model that describes the value of waiting to enforce a debt.
- The model shows that creditor inactivity may be rational for Russian banks, because the value of waiting is fairly high in Russia. This is mainly due to the high costs of enforcement.
- In addition banks are trapped in a non-enforcement Nash-equilibrium.
- The problem of creditor inactivity cannot be solved by stabilisation alone. One badly needs to install strict bank supervision, some kind of properly priced and explicit deposit insurance and workable bankruptcy proceedings.
- So corporate governance was very weak or absent in early transition, leaving restructuring basically to management and workers, who in most cases became majority stockholders.
- However, banks have been exerting some corporate governance through direct ownership links between enterprises and banks in the framework of financial-industrial groups.
- A number of large nationwide banks have emerged. They are at the centre of financial-industrial conglomerates and do well with respect to credit allocation and industrial restructuring.
- Also smaller banks have established ownership links with industrial enterprises.
- Nevertheless, the majority of enterprises remains insider-controlled and has to rely on retained earnings to finance restructuring and growth.

1. Theoretical argument

1.1. The literature

Effective corporate control is one of the main determinants of the success of enterprise restructuring. Without it, restructuring becomes longer and more painful, since it will be ultimately ensured by bankruptcy procedures and liquidation. The speed and success of restructuring would benefit greatly from **outside control** that ensures effective corporate governance.

One can look at effective corporate control as a principal-agent situation. The managers of a firm are the agents of two principals, namely owners and creditors. All three parties have different utility functions and dispose of different information. Management maximises a personal utility function, which can contain anything. In the case of uncertainty about property rights and absence of control mechanisms, managers might be tempted to divert enterprise wealth into their own pocket. Shareholders prefer that managers maximise the value of equity. Creditors prefer managers to minimise the probability of default. This definition implies that shareholders in general prefer managers to pursue more risky policies than creditors would want them to pursue, since shareholders do not face an upper limit on revenues and thus would reap the full benefits of risky investments in terms of higher future dividends, while losses have a lower boundary because of the possibility of bankruptcy. Creditors on the contrary mostly face a strict upper limit on revenues and are therefore not interested in risky policies.

A single principal-agent problem could be solved by writing special **managerial contracts** that incorporate the appropriate incentive compatibility constraints, as proposed by Jensen and Meckling (1976) and Jensen and Murphy (1991). Stock options, profit shares and straightforward shareholdership are real life examples of such contracts. However, these contracts can never be perfect because the two principals pursue different goals and because of the prevalent information asymmetries. Theory suggests a **scala of other mechanisms** by which the principals try to control management and urge it to pursue their preferred policies. Phelps et al.(1993) give an adequate overview. The optimal mechanism would urge managers not to deviate too far from policies that maximise the value of the firm, because that policy offers a consensus between the two principals. Apart from the scala of control mechanisms the literature considers two models of corporate governance: the **market-based Anglo-American or Anglo-Saxon model** that relies on competitive markets and transparency to provide outside control, and the **bank-based model**, that stresses the importance of universal banks in corporate control and provides more active inside control.

In the Anglo-American model corporate control is assured by indirect measures. **Competitive markets** are at the very heart of the system, most importantly markets for management competence, capital markets and product markets. Since there is an active **market for managerial competence**, managers are eager to maximise the value of their firm, because doing so improves their reputation (Fama, 1980) which drives up their own market value and hence their financial wealth. The **capital market** is important because enterprises in this model mainly finance long term investment by issuing stock or bonds. The cost of issuing stock or bonds will be linked to the market valuation of the firm, through share prices and credit ratings, and all managers have an interest in cheap capital. The capital market also creates a continuous threat of **hostile take-over or proxy fight** (Jensen and Ruback, 1983), which usually involves

firing general management. The best way for management to avoid hostile take-overs or proxy fights is to maximise the value of the firm, because then take-overs or proxy fights cannot yield any rent and thus will not occur. **Competition on product markets** punishes bad managerial performance by liquidity problems and ultimately bankruptcy. Banks have the limited role to supply short term financing of working capital. They can exert some control by using short maturities, collateral, loan covenants and ultimately bankruptcy proceedings. A market-based system requires openness of the financial system and the functioning of rating devices such as stock exchanges or credit rating agencies. Market valuation in terms of share prices and credit ratings can only be accurate if the firms supply the information needed. This requires an appropriate regulatory and business environment.

The bank-based approach stresses the importance of banks in an environment with **information asymmetries**. Diamond (1984) showed that private bank debt, with depositors delegating the monitoring effort to the bank, is Pareto superior to directly placed debt for reasons of diversification of the bank. The underlying reason for Pareto superiority of banks is to be found in the information asymmetries which make monitoring costly. However, lending by banks does not in itself assure effective corporate control. Information asymmetries and hence the need for costly monitoring imply that **concentrated debt- and shareholdership** will be more efficient and will lead to better monitoring for two reasons. First, larger shares of debt and equity lower the relative cost of monitoring and screening. Second larger shares give debt- and shareholders more ability to exert effective control in terms of access to information and voting rights. Schleifer and Vishny (1986) show that active block investors can indeed provide effective corporate control. However we still face the problem that the two categories of principals aim at contradictory goals, which could cause incentive incompatibility. Stiglitz (1985) showed that this problem can be solved by allowing **large shareholders and large debtors to be the same agents**. In that way the debtor-shareholder has an interest in maximising the value of the firm, and has the power to urge management to pursue adequate policies to reach that goal. However, one does not need the strict hierarchy of direct ownership, since also quasi-hierarchies will yield economies of close relationships. The literature on economies of internalisation in financial intermediaries focuses on efficiency gains from better information exchange within a hierarchy or a quasi-hierarchy when compared to market transactions (Gray and Lundan, 1993). This clearly refers to the close relationships between German house-banks and their large corporate clients or to the close relationships within Japanese keiretsu. Dewatripont and Tirole (1993) show that large debtors indeed can exert effective corporate control even without holding stock. They show that major debt-holders have better access to information and more incentives to monitor than a large number of small lenders and thus assure better corporate control. Such debtors could play the role of active shareholders in good times and active debt-holders in bad times. In times of financial difficulties the debtors should take the lead of restructuring.

German house-banks or Japanese main banks dominating a keiretsu are typical examples of what a bank-based system could look like. Note that Walter (1993) identifies two subclasses within the class of bank-based systems, namely insider systems, embodied by dominating debtor-shareholders such as the German house-banks, and ultra-insider systems, embodied by Japanese keiretsu structures with reciprocal equity holdings and interlocking directorships.

1.2. Optimal system design for Russia

There is important theoretical and empirical literature that tries to assess the relative strengths and weaknesses of both systems. We will not reproduce this discussion here. Prowse (1994) gives a comprehensive overview and adds that the corporate control systems in different countries are **uniquely related to the legal and regulatory environment of the firm**. Indeed, all systems have pro's and con's and seem to approach optimality within their own regulatory, cultural and economic framework. We use this idea as the starting point of further analysis.

There is no consensus in the literature which system would fit Russia better, the Anglo-Saxon market-based system or rather the European-Japanese bank-based system. Walter (1992) claims that the Anglo-American model is inappropriate for any European transition country. Van Wijnbergen (1992) and Corbett and Mayer (1991) agree and propose banks should indeed play an active role in enterprise restructuring, a typical feature of the bank-based system. Claassen (1993) argues that debt-equity swaps are preferable because they facilitate both mass privatisation and bank-led restructuring, which fits in the European traditional role of banks in corporate control. Steinherr (1993) seems to agree on this principle but puts forward that the emerging banking sector is not capable to perform such a huge task. Mc Kinnon (1991) takes the opposite stance. According to him the prevalent moral hazard makes efficient allocation through bank lending impossible. He proposes to initially prohibit lending to liberalised enterprises and force those enterprises to finance with retained earnings. In a later stage he would allow only limited and fully collateralised lending according to the "real bills doctrine", while borrowing from the non-bank capital market would be free. This is a version of the Anglo-American model. However, these studies concentrated on Central and Eastern European Transition Countries (CEETC) and not on Russia with its specific features.

Theory suggests that banks have a positive added value over markets only in the case of asymmetric information. For various reasons banks will have difficulties to fulfil their role as monitors in Russia. Even worse, banks may face perverse incentives to lend to unviable borrowers, as we showed at length in chapter V. Mc Kinnon (1991) basically uses this argument of distorted monitoring by banks to argue for a market-based model. However, efficient capital markets are absent and will not emerge in the near future because the appropriate economic, regulatory and cultural environment is not in place and because of the severe information asymmetries. Therefore we argue that the choice is not between bank loans or capital markets but rather between self financing, central bank loans and bank loans. Capital markets will not do the job because of practical reasons. We agree with Gros and Steinherr (1995) that, taking into account the low level of development of the Russian financial sector, the banking versus markets debate misses the point. They are not alternatives since banking will almost naturally precede markets. Therefore we conclude with Phelps et al.(1993) that outsider control by banks is the only appropriate option to stimulate enterprise restructuring and performance in CEETC, since capital markets will not be able to fulfil this role in the near future. Note that Phelps et al. (1933) go further than this minimal stance. They claim that there probably exists a trade-off between the development of capital markets, with impersonal valuations of enterprises and disincentives for private monitoring, and the development of banks (and other financial institutions) which stimulates the involvement of banks in corporate control and thus builds monitoring skills at the level of the bank (Phelps et al., 1993, p. 33). Therefore the stress on developing capital markets (stock and bonds) could actually hamper restructuring because it

prevents the building of monitoring skills. We prefer the minimal stance. We think this last criticism misses the point. We argue that it will be impossible to develop capital markets in the short run and hence that the theoretical disincentive to monitor will never materialise.

Considering all this, we think that one should concentrate on two issues : (1) How can one best **stimulate the involvement of banks** in corporate control and the development of their monitoring skills and (2) who will **monitor the monitor**? The second question refers to the domain of bank regulation and bank supervision. The development of capital markets and hence risk capital should be promoted, but not be expected to matter much in the near future. The matter of bank supervision was already addressed in chapter III, where we discovered that bank supervision was a disaster zone in early transition. Therefore we concentrate on involvement of banks in corporate control in this chapter.

2. Creditor inactivity

2.1. Introduction

Creditor inactivity has been observed throughout Central and Eastern Europe. Creditors are not enforcing their bad loans. For Russia, it is clear that bad loans are not a stock problem, but rather a flow problem. Bad loans, inherited from communist predecessors, were vaporised by the inflation shock in 1992. The high level of bad loans is therefore largely due to the flow of bad loans during transition. Creditor inactivity plays an important role here. Bad loans do not disappear from balances because they are not enforced to an extent comparable to market economies. There is clear evidence of this in Fan, Lee and Schaffer (1996). They analyse the data of a World Bank survey of 1994 on 439 Russian industrial enterprises. 203 of the surveyed enterprises had in the past two years failed to repay bank debt in time. Of these 203 cases of bad loans the bank capitalised interest in 101 cases, rescheduled the principal in 85 cases and took legal action in 0 cases. This clear reluctancy of banks to involve in corporate control is a typical and unpredicted feature of all transition economies. It has some adverse consequences.

Creditor inactivity impedes enterprise restructuring, for it links the fate of the financial sector and the formerly state-owned production sector together and disables banks to play an active role in corporate control. Bad loans prolong the existence of soft budget constraints, since they amount to an implicit subsidy to insolvent enterprises. The burden of this subsidy is carried by savers (if the bank goes bankrupt), solvent enterprises (that pay higher interest rates on loans in the case that banks finance bad loans with higher intermediation margins) or the budget (in the case of deposit insurance and bailout of insolvent banks by the budget). If the budget pays, it will be financed with lower expenditure in other areas, higher taxes, or deficits which in turn cause inflation tax, or crowding out-effects. Bad loans have caused a series of bank failures recently. However, in the period under study, the CBR granted banks liquidity by a large flow of DC, that were officially to be returned, but were in practice not always returned (see chapter III). This has seriously hampered enterprise restructuring.

Creditor inactivity also has a large information cost. It reduces the transparency of both banks and enterprises in an environment that cries out for information. This endangers the efficiency of privatisation, allocation of funds and restructuring, and in general the efficient functioning of

a bank-based system of corporate control.

There is some literature on the explanation of creditor inactivity. Mitchell (1992) and Begg and Portes (1993) mention several rationales for it. First, banks may not initiate bankruptcy because the **"expected value of the debtor's assets are less than the costs of enforcing bankruptcy"**. Bankruptcy costs tend to be very high and the real value of assets is generally lower than shown in the accounts. Second, **waiting may have an option value.** This refers to the literature on the value of waiting in investment decisions (Dixit, 1990). Third, initiating a bankruptcy procedure can be looked at from the framework of signalling games. Bank-initiated bankruptcy procedures function as a **signal of the quality of the loan portfolio.** Perception of bad portfolios by other players may be punished by markets (through the credit rating) and by the regulatory authorities and therefore it may be a wise strategy not to initiate bankruptcy procedures on borrowers openly. Last, the authors point at a **free rider problem** within the context of the soft budget constraint. If every bank suspects that other banks will postpone adjustment in order to draw more from the government and therefore expects the bailout to be necessary, such an expectation will be self-fulfilling.

2.2. The model

We develop a model on creditor inactivity that tries to capture the trade-off between the various arguments. We build a model that allows us to analyse rational creditor behaviour for the simple case of one creditor and one debtor. Gradually we make the model more complex and realistic by incorporating aspects that reach beyond the assumptions of the simple case. The specific behaviour of creditors in transition economies will become understandable by showing that transition affects the parameters in the model in such a way that waiting (creditor inactivity) is rational behaviour.

2.2.1. The simple case of one debtor and one creditor

We develop a model that captures the net value of waiting W for a creditor. Suppose that at the end of the credit term a debtor fails to pay his debt. The creditor can either enforce his claim now or postpone his decision till the next period. In that next period the debtor may pay or may not pay. The creditor can be paid or enforce payment or wait again until the next period. In principle, this process can be continued eternally. We elaborate a formula for W and then try to determine under what conditions W is positive or in other words we look for a condition that determines whether a creditor will wait or rather enforce immediately. Define:

π = *probability that the debtor pays his debt during the next period*
$(1-\pi)$ = *probability that the debtor fails on his debt during the next period*
$(1-\lambda)$ = *expected cost of enforcement (as % of the nominal value N)*
λ = *expected value of enforcement, net of enforcement costs*
β = *indicator of time preference*
N = *nominal value of the claim*

$$0 \le \pi, \lambda, \beta \le 1$$

Using these variables, we can define the net present value of waiting Wt (further simply the value of waiting) as the net present value of payment in the next period, added the value of

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waiting in the next period, minus the lost opportunity value of enforcement in this period :

$$W_t = \pi\beta^t N - \lambda\beta^{t-1}N + (1-\pi)W_{t+1} \qquad\qquad t\in[1,\infty] \qquad\qquad (7.1)$$

Then we can solve (7.1) for the value of infinite waiting W:

$$W_1 = \pi\beta N - \lambda N + (1-\pi)W_2$$
$$\textit{by forward substitution}$$

$$
\begin{aligned}
W_1 &= \pi\beta N - \lambda N + (1-\pi)(\pi\beta^2 N - \lambda\beta N) + (1-\pi)^2(\pi\beta^3 N - \lambda\beta^2 N) + \ldots + (1-\pi)^i(\pi\beta^{i+1}N - \lambda\beta^i N) \\
&= \sum_{i=0}^{\infty}(1-\pi)^i(N\beta^i(\pi\beta - \lambda)) \\
&= N(\pi\beta - \lambda)\sum_{i=0}^{\infty}((1-\pi)\beta)^i
\end{aligned}
\qquad (7.2)
$$

$$\frac{W}{N} = \frac{(\pi\beta - \lambda)}{1 - \beta(1-\pi)}$$

Since the denominator is positive, we easily find the condition for a positive value of waiting :

$$
\begin{aligned}
W > 0 \qquad &\Rightarrow (\pi\beta - \lambda) > 0 \\
&\Rightarrow \pi\beta > \lambda
\end{aligned}
\qquad (7.3)
$$

We can conclude that the sign of the value of waiting directly depends on the subjective probability of payment in the next period, the time preference of the creditor and the cost of enforcement. As W is the net value of waiting, the condition for positive value of W is also the condition for non-enforcement of claims. We analyse how changes in the parameters affect the value of waiting by calculating partial derivatives of (7.2).

$$\frac{\partial W}{\partial \lambda} = \frac{-N}{(1 - \beta + \beta\pi)} \qquad < 0$$

$$
\begin{aligned}
\frac{\partial W}{\partial \pi} &= \frac{N\beta(1 - \beta + \beta\pi) - \beta(-N\lambda + N\beta\pi)}{(1 - \beta + \beta\pi)^2} \\
&= \frac{\beta N(1 - \beta + \lambda)}{(1 - \beta + \beta\pi)^2} \qquad > 0
\end{aligned}
$$

$$
\begin{aligned}
\frac{\partial W}{\partial \beta} &= \frac{N\pi(1 - \beta + \beta\pi) - (\pi - 1)(-N\lambda + N\beta\pi)}{(1 - \beta + \beta\pi)^2} \\
&= \frac{N(\pi - \lambda + \lambda\pi)}{(1 - \beta + \beta\pi)^2} \qquad > 0
\end{aligned}
$$

All derivatives have the expected sign. The interpretation is straightforward : The value of waiting is decreasing in the time preference of the creditor (or increasing in β), increasing in the cost of enforcement (or decreasing in λ), and increasing in the probability π that the debtor

will pay in the next period. These conclusions are trivial and could be seen from (7.2) directly. W/N is an appropriate measure for the net benefit of waiting for a creditor. If we find substantial values for W/N, then waiting can be understood as rational behaviour. This will be done below in section 2.3.2. As it can only deliver infinite waiting or immediate enforcement, this setting is a crude simplification. This stems, among others, from our assumption that π is constant over time. In such a setting governments can only reduce creditors' propensity to wait by influencing λ. In the next section we make the model more realistic by abandoning the assumption of constant π.

2.2.2. Debtor reputation effects

We postulate that π goes to 0 with time. One can interpret this as a debtor reputation effect. The longer the period of non-payment by a debtor, the worse his reputation and thus the lower the subjective probability the creditor will assign to reimbursement by the debtor in the next period. It would be very useful to have a mathematical form that considers the scale of the reputation effect and at the same time gives information about the **optimal waiting period**: How long will a rational creditor wait to enforce and what will be the value of waiting till this optimal moment ?

In order to find this general form we postulate a distribution of π_t, that can be parameterised for the reputation effect. **We redefine π_0 as the probability, on the moment of the credit agreement, assigned by the creditor to repayment of the loan by the debtor within the term of the agreement**. The game starts at t=0, when the debtor does not pay his debt within the term (π_0 has not materialised). We assume that π_t is a decreasing function of time, going from π_0 to 0. This can easily be formalised by the following formula:

$$\pi_t = \pi_0 \, e^{-\alpha t} \qquad\qquad , \alpha \geq 0 \qquad\qquad (7.4)$$

This is a classical formulation for learning effects, where the learning is now interpreted as an adaptive expectations mechanism that produces creditor expectations of future payment by the debtor, conditional on past debtor payment behaviour. Adaptation can be slow or fast. This is captured by the parameter of the reputation effect α, with $\alpha = 0$ for no reputation effect and $\alpha = \infty$ for extreme reputation effect[1]. For $\alpha = 0$ the model reduces to (7.2). One can look at it as a weight, attributed to the initial π_0 and decreasing with time. Note that according to this formula the probability of payment in future periods falls degressively. Assuming all this, we can derive the value of waiting :

$$W_1 = \pi_t \beta N - \lambda N + (1 - \pi_t) W_2$$

by forward substitution

$$W = \pi_1 \beta N - \lambda N + (1 - \pi_1)(\pi_2 \beta^2 N - \lambda \beta N) + (1 - \pi_1)(1 - \pi_2)(\pi_3 \beta^3 N - \lambda \beta^2 N) + ...$$

$$+ \prod_{t=1}^{\infty} (1 - \pi_t) \beta^t (\pi_{t+1} \beta N - \lambda N)$$

$$W = \sum_{t=0}^{\infty} (\prod_{\upsilon=1}^{t} (1 - \pi_\upsilon) \beta^t (\pi_{t+1} \beta N - \lambda N))$$

(7.5)

(7.5) describes the value of waiting as a weighted sum of marginal values of waiting, where the weight is $\prod(1 - \pi_\upsilon) \beta^t$. There exists no analytical solution for (7.5), as provided in (7.2) for the simple model, mainly because one cannot find a short-cut formula that describes the weight $\prod(1 - \pi_\upsilon) \beta^t$. We can however calculate solutions for certain values of parameters. For example one easily sees that for $\alpha = 0$, (7.4) is reduced to the non-reputation case and thus (7.5) is reduced to (7.2). Also, we can find an analytical solution for the optimal period of waiting. **If we assume that the creditor is rational, then he will maximise the expected value of waiting** and thus wait till the marginal value of waiting one more period becomes negative, because waiting beyond that point of time would reduce the value of waiting, which is just a weighted sum of marginal values of waiting. Thus we substitute (7.4) into (7.5) and look for a point in time t_0 where the marginal value of waiting becomes negative. If the debtor has not paid before this moment t_0, the probability-weighted discounted net revenue from further waiting is lower than the discounted revenue from immediate enforcement. Because we assumed (7.4) and $0 < \beta < 1$, we know that the weight $\prod(1 - \pi_\upsilon) \beta^t$ is a decreasing function of time which goes to 0 for t going to ∞. Therefore we can define the optimal period of waiting t_0 as follows:

$$W = \sum_{t=0}^{\infty} (\prod_{\upsilon=1}^{t} (1 - \pi_0 e^{-\alpha \upsilon}) \beta^t (\pi_0 e^{-\alpha(t+1)} \beta N - \lambda N))$$

$$\Rightarrow t_0 = (\frac{1}{\alpha} \ln(\frac{\beta \pi_0}{\lambda})) - 1$$

(7.6)

The interpretation of (7.6) is straightforward. The higher the reputation effect α, the lower t_0 and thus the faster a creditor will enforce. Next to this we see that :

$$if \ \alpha \geq \ln(\frac{\beta \pi_0}{\lambda})$$

$$\Rightarrow t_0 \leq 0$$

(7.7)

So, **if the reputation effect is severe enough**, the optimal period of waiting can (theoretically) be negative and therefore there will be **immediate enforcement**. We can see that the relation between on the one hand the enforcement value λ and on the other hand the product of the discount factor β and the initial probability π_0 is again of central importance, as it was in

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(7.3). If $\lambda > \beta\pi_0$, then $\ln(\beta\pi_0/\lambda) < 0$. Since $\alpha > 0$ by definition, condition (7.7) is fulfilled and t_0 will be negative. So, we find condition (7.3) for a positive value of infinite waiting. However, we can now find more precise condition for a positive value of waiting by rewriting (7.7) as follows :

$$t_0 \geq 0$$

$$\Leftrightarrow \alpha \leq \ln(\frac{\beta\pi_0}{\lambda})$$

$$\Leftrightarrow \lambda \leq \frac{(\beta\pi_0)}{e^{\alpha}} \tag{7.8}$$

Finally, we can look for a formulation of the optimal value of waiting. A rational person will wait till t_0 and then enforce his claim. So W/N can easily be denoted as follows :

$$\frac{W}{N} = \lambda(1-\pi_0 e^{-\alpha(t_0+1)})\beta^{t_0+1} + \sum_{t=0}^{t_0}(\prod_{\upsilon=1}^{t}(1-\pi_0 e^{-\alpha\upsilon})\beta^t(\pi_0 e^{-\alpha(t+1)}\beta-\lambda)) \tag{7.9}$$

(7.9) cannot easily be solved to a more simple formula. We can however solve (7.6) and (7.9) for any given parameter and compare the levels. Again it is important to perform such simulations for t_0 and W/N.

2.3 Empirical relevance of the model

2.3.1. Parameter values

For calculations of (7.2) and (7.8) we need acceptable values for λ, π, β and α.
For the sake of simplicity, we assume that the time preference β is exclusively determined by inflation. The influence of real interest rates is omitted because they are very unstable in Russia, varying from negative values during initial inflation shocks, to very high values after price stabilisation. Assuming this, one can easily obtain estimates for β, using data on consumer price inflation. Name the average monthly inflation p and the consumer price index of a certain month t as CPI_t. Using a month as the standard unit of time we find β for a given period of t months :

$$\beta = \frac{1}{1+p}$$

$$= \frac{1}{\sqrt[t]{1+\frac{CPI_t-CPI_0}{CPI_0}}} \tag{7.10}$$

Estimations of π_0 for Russian debtors are troublesome because of the inflationary environment and the lack of good data. If we had good data, we could simply take the growth of bad loans in a certain period and divide it by the relevant amount of the new loans out of which the bad loans emerged to find an estimate for π_0. However, we only have a time series of CBR-data on

the stock of loans and the stock of bad loans. This source may not be trustworthy, because it is based on bank data, that are probably underestimating bad loans. We therefore base our estimate on Goskomstat-data, that are based on enterprise accounts. The incentive to hide bad loans may be a lot lower for enterprises than for banks. Schaffer and Alfandari (1995) find that bad loans may be anything between 15% and 25% of loans. We use an estimate for π_0 of 0.85, which seems to be reasonable. We used the same value in chapter VI to define Lq. The intrinsic value of π_0 cannot be determined, because a lot of credit demand was rationed in 1994. The loan quality that shows in the data may be adversely affected by high interest spreads. However, the intrinsic quality of projects that apply for credit, may be higher than the average quality of projects that receive credit. Therefore we must realise that the estimate of π_0 is in practice conditional on the interest spread, required collateral and other factors.

Defining α from data is not really possible. We mentioned before that one can look at α as a degressively decreasing weight attributed to the initial π_0. In table VII.1. we show how these weights behave. These simple calculations show that choosing $\alpha>5$ makes no sense, because this simply amounts to immediate enforcement, the weight being immediately very close to 0. So it makes sense to limit the domain of α from 0 to 5. Table VII.1. allows us to choose the appropriate α.

Table VII.1. Values for the weights using (7.4) (weight = $e^{-\alpha t}$)

t / α	1	2	3	4	5	6	7	9	10	15	20	25	30	50
0	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
.05	0.9512	0.9048	0.8607	0.8187	0.7788	0.7408	0.7047	0.6376	0.6065	0.4724	0.3679	0.2865	0.2231	0.0821
.1	0.9048	0.8187	0.7408	0.6703	0.6065	0.5488	0.4966	0.4066	0.3679	0.2231	0.1353	0.0821	0.0498	0.0067
.2	0.8187	0.6703	0.5488	0.4493	0.3679	0.3012	0.2466	0.1653	0.1353	0.0498	0.0183	0.0067	0.0025	
.3	0.7408	0.5488	0.4066	0.3012	0.2231	0.1653	0.1225	0.0672	0.0498	0.0111	0.0025	0.0006	0.0001	
.4	0.6703	0.4493	0.3012	0.2019	0.1353	0.0907	0.0608	0.0273	0.0183	0.0025	0.0003			
.5	0.6065	0.3679	0.2231	0.1353	0.0821	0.0498	0.0302	0.0111	0.0067	0.0006				
.6	0.5488	0.3012	0.1653	0.0907	0.0498	0.0273	0.0150	0.0045	0.0025	0.0001				
.7	0.4966	0.2466	0.1225	0.0608	0.0302	0.0150	0.0074	0.0018	0.0009					
.8	0.4493	0.2019	0.0907	0.0408	0.0183	0.0082	0.0037	0.0007	0.0003					
.9	0.4066	0.1653	0.0672	0.0273	0.0111	0.0045	0.0018	0.0003	0.0001					
1	0.3679	0.1353	0.0498	0.0183	0.0067	0.0025	0.0009	0.0001						
1.5	0.2231	0.0498	0.0111	0.0025	0.0006	0.0001								
2	0.1353	0.0183	0.0025	0.0003										
5	0.0067													
10	0.0000													

Last, we must find reasonable ranges for λ. It is close to impossible to accurately calculate the cost of enforcement in Russia from real bankruptcy cases because of the lack of data and the possibility of severe selection bias. On 19 November 1992 the Supreme Soviet adopted a bankruptcy law which was not operational until May 1993. Yet only 10 enterprises were declared bankrupt before March 1994. In May and June the government tried to support the effectiveness of bankruptcy procedures by founding a Bankruptcy Agency. Unfortunately this agency saw not as its role to promote bankruptcy proceedings and probably even slowed down the process. There are no data on enforcement costs[2] and even if one could find data on the rare cases of actual bankruptcies one would face a severe selection bias. One would underestimate the costs of enforcement, because one would have selected the cases where the costs of enforcement are the lowest, which is precisely the reason why there was enforcement in the first place.

Note also that in practice a lot of enforcement may be effected with unofficial methods, such as coercion or threat. The criminalisation of economic life is to a large extent due to the lack of operational legal instruments to settle business disputes. In a way the mafia filled this legal and jurisdictional vacuum that emerged in the initial stage of transition, after the old system collapsed and before a new system was in place. The role the mafia plays is not completely negative in this respect. Without criminal methods to enforce bad loans, λ would possibly be very close to zero, which would have led to an explosion of bad loans and a complete collapse of the already deficient credit allocation by banks to enterprises.

The model allows us to circumvent this problem and calculate indicative costs of enforcement without actual data on bankruptcies. Therefore it also incorporates hidden components (other barriers to enforcement). Since creditor passivity prevails in Russia ($W>0$), we can estimate maximum values for λ using (7.8). Table VII.2. shows estimates of maximum values for λ .

Table VII.2. Maximum values for λ using (7.8)

	$\alpha = 0$					$\alpha = 0.1$					
π_0	0.99	0.95	0.9	0.85	0.8	0.99	0.95	0.9	0.85	0.8	β
p											
0.01	0.98	0.94	0.89	0.84	0.79	0.89	0.85	0.81	0.76	0.72	0.99
0.05	0.94	0.9	0.86	0.81	0.76	0.85	0.82	0.78	0.73	0.69	0.95
0.1	0.9	0.86	0.82	0.77	0.73	0.81	0.78	0.74	0.7	0.66	0.91
0.15	0.86	0.83	0.78	0.74	0.7	0.78	0.75	0.71	0.67	0.63	0.87
0.2	0.83	0.79	0.75	0.71	0.67	0.75	0.72	0.68	0.64	0.6	0.83
0.25	0.79	0.76	0.72	0.68	0.64	0.72	0.69	0.65	0.62	0.58	0.80
0.3	0.76	0.73	0.69	0.65	0.62	0.69	0.66	0.63	0.59	0.56	0.77

	$\alpha = 0.2$					$\alpha = 0.5$					
π_0	0.99	0.95	0.9	0.85	0.8	0.99	0.95	0.9	0.85	0.8	β
p											
0.01	0.8	0.77	0.73	0.69	0.65	0.59	0.57	0.54	0.51	0.48	0.99
0.05	0.77	0.74	0.7	0.66	0.62	0.57	0.55	0.52	0.49	0.46	0.95
0.1	0.74	0.71	0.67	0.63	0.6	0.55	0.52	0.5	0.47	0.44	0.91
0.15	0.7	0.68	0.64	0.61	0.57	0.52	0.5	0.47	0.45	0.42	0.87
0.2	0.68	0.65	0.61	0.58	0.55	0.5	0.48	0.45	0.43	0.4	0.83
0.25	0.65	0.62	0.59	0.56	0.52	0.48	0.46	0.44	0.41	0.39	0.80
0.3	0.62	0.6	0.57	0.54	0.5	0.46	0.44	0.42	0.4	0.37	0.77

	$\alpha = 1$					$\alpha = 2$					
π_0	0.99	0.95	0.9	0.85	0.8	0.99	0.95	0.9	0.85	0.8	β
p											
0.01	0.36	0.35	0.33	0.31	0.29	0.13	0.13	0.12	0.11	0.11	0.99
0.05	0.35	0.33	0.32	0.3	0.28	0.13	0.12	0.12	0.11	0.1	0.95
0.1	0.33	0.32	0.3	0.28	0.27	0.12	0.12	0.11	0.1	0.1	0.91
0.15	0.32	0.3	0.29	0.27	0.26	0.12	0.11	0.11	0.1	0.09	0.87
0.2	0.3	0.29	0.28	0.26	0.25	0.11	0.11	0.1	0.1	0.09	0.83
0.25	0.29	0.28	0.26	0.25	0.24	0.11	0.1	0.1	0.09	0.09	0.80
0.3	0.28	0.27	0.25	0.24	0.23	0.1	0.1	0.09	0.09	0.08	0.77

2.3.2. Estimates for the value of waiting and the optimal waiting period

2.3.2.1. The simple case

For Russia we use the following parameters : Monthly inflation p of about 20% for 1992-1994, with a corresponding value for β of 0.83, and a probability of payment π of 85%. Since α=0 for the simple case, we look for maximum values of λ in the left upper panel of table VII.2. and find values of about 70%. Therefore a λ of only about 50% will certainly not be an overestimation. This low λ was to be expected, because of the absence of experience with regular bankruptcy proceedings. Using these values, calculations of W/N (7.2) produce quite some information. In table VII.3., we see that a Russian creditor can expect a gain of **about 25%** by infinite waiting, so waiting yields a substantial benefit. Second, the table shows that for a given value of λ, W/N rises with π and β. Thus, stabilisation in terms of lower time preference (higher β) and higher probability of payment (higher π) will, according to these estimations, not reduce waiting. If for example Russian inflation decreases below 5% monthly, π rises above 90%, and λ remains stable at 50%, then the benefit from waiting becomes **larger than 40%**. This can also be seen directly from (7.2). Last, we observe that there will be immediate enforcement (W/N < 0.) if λ is high enough. So the temporary conclusion seems to be that the clue to creditor activity is not stabilisation but rather raising λ, which means introducing workable bankruptcy proceedings.

Table VII.3. Values for W/N for given values of parameters using (7.2)

π	0.99	0.95	0.9	0.85	0.8	0.99	0.95	0.9	0.85	0.8	p
β	λ = 0.99					λ = 0.7					
0.99	minus	minus	minus	minus	minus	0.28	0.25	0.21	0.17	0.12	0
0.95	minus	minus	minus	minus	minus	0.25	0.22	0.17	0.13	0.10	0.10
0.91	minus	minus	minus	minus	minus	0.20	0.17	0.13	0.10	0	0.10
0.87	minus	minus	minus	minus	minus	0.16	0.13	0.10	0	minus	0.15
0.83	minus	minus	minus	minus	minus	0.13	0.10	0.10	0	minus	0.20
0.8	minus	minus	minus	minus	minus	0.10	0.10	0	minus	minus	0.25
0.77	minus	minus	minus	minus	minus	0.10	0	minus	minus	minus	0.30
β	λ = 0.5					λ = 0.3					
0.99	0.49	0.46	0.43	0.40	0.36	0.69	0.67	0.66	0.64	0.61	0
0.95	0.45	0.43	0.40	0.36	0.32	0.65	0.64	0.62	0.59	0.57	0.10
0.91	0.40	0.38	0.35	0.32	0.28	0.61	0.59	0.57	0.55	0.52	0.10
0.87	0.36	0.34	0.31	0.28	0.24	0.57	0.55	0.53	0.51	0.48	0.15
0.83	0.33	0.30	0.27	0.24	0.20	0.53	0.51	0.49	0.47	0.44	0.20
0.8	0.29	0.27	0.24	0.21	0.17	0.50	0.48	0.46	0.43	0.41	0.25
0.77	0.26	0.24	0.21	0.17	0.14	0.47	0.40	0.43	0.40	0.37	0.30

2.3.2.2. Debtor reputation effects

In table VII.4 and table VII.5 we calculated respectively W/N and t_0 for a reasonable range of parameter values. Let us read this table. As a start we leave β at 0.83 and π_0 at 80%-90% (which yields $\pi_0\beta$ of about 0.71) and assume a weak reputation effect, say $\alpha = 0.1$. From table VII.2., we see that this produces maximum values of λ of 64%, with again actual values of λ of 50% being very reasonable.

Applying these parameter values to (5.6) we find in table VII.4 an optimal period of waiting of t_0 of about 6 months. Stabilisation could only raise t_0 above 12 months. However, reducing enforcement costs to 5% of the value of the loan ($\lambda = 0.95$) would induce immediate enforcement ($t_0 < 0$). Higher enforcement costs on the other hand can raise t_0 higher than 40 periods. All this seems to confirm the conclusions of the non-reputation model.

Let us turn our attention to table VII.5. Unfortunately, we cannot take $\pi\beta$ together because (10) is determined by π and β separately. This makes the presentation more difficult. We present p as column heading for the whole table (β is determined by p), and let π change from 85% to 95%, because this allows us to determine the effect of stabilisation. To calculate W/N, we first calculated t_0, took the largest integer number smaller than t_0, and then used it to estimate W/N. If $0 < t_0 < 1$, we assume immediate enforcement. This is indicated in the table with 'enf', which stands for immediate enforcement, and '<1', which means that $t_0 < 1$.

In table VII.5. we observe that the benefit W/N from waiting till t_0 can be very substantial and that stabilisation will increase the benefit substantially. For Russia we get a W/N of more than 20% and, in the case of stabilisation, almost 40%. We also see that the benefit W/N is determined by λ and α. In any economy with weak reputation effects (low α) and high enforcement costs (low λ), the net benefit derived from waiting can be very substantial (more than 50% is very well possible) and vice versa, quite independent from time preference or probability of payment. Last, we note from table VII.5. that reputation effects not only lower the optimal period of waiting t_0, but also significantly reduce the benefit W/N one receives by waiting till t_0. We conclude that a rational creditor will reduce waiting if reputation effects are in place.

The introduction of reputation effects has certainly contributed to our understanding of waiting behaviour. First, the reputation effect has introduced the idea of an optimal waiting period. The question is twofold now : Will a creditor wait and how long will he wait? Second, the stronger the reputation effect, the stronger condition (7.8) or the lower the probability that waiting will be optimal. Hence, reputation effects stimulate enforcement. Table VII.4 shows that **the most important determinant of t_0 is indeed the reputation effect.** For values of $\alpha \geq 1$, one can get substantially positive values for t_0 only for extremely low values of λ. So with strong reputation effects, waiting is very unlikely and the optimal period of waiting, if positive, is very low. If for example Russia could introduce moderate reputation effects (say $\alpha = 0.5$), then even extremely high enforcement costs of 90% ($\lambda = 0.1$) would ceteris paribus give a t_0 of about 3 months only.

Table VII.4. Values for the optimal period of waiting t_0, using (7.8)

For $\alpha = 0$, there is only immediate enforcement or infinite waiting (see table 5)

$\alpha = 0.05$

$\lambda\backslash\pi\beta$	0.99	0.97	0.95	0.93	0.9	0.85	0.8	0.75	0.7	0.65	0.6
0.9	0.91	0.50	0.08	minus	minus	minus	minus	minus	minus	minus	minus
0.7	5.93	5.52	5.11	4.68	4.03	2.88	1.67	0.38	minus	minus	minus
0.5	12.66	12.25	11.84	11.41	10.76	9.61	8.40	7.11	5.73	4.25	2.65
0.3	22.88	22.47	22.05	21.63	20.97	19.83	18.62	17.33	15.95	14.46	12.86
0.1	44.85	44.44	44.03	43.60	42.94	41.80	40.59	39.30	37.92	36.44	34.84

$\alpha = 0.1$

$\lambda\backslash\pi\beta$	0.99	0.97	0.95	0.93	0.9	0.85	0.8	0.75	0.7	0.65	0.6
0.8	1.13	0.93	0.72	0.51	0.18	minus	minus	minus	minus	minus	minus
0.7	2.47	2.26	2.05	1.84	1.51	0.94	0.34	minus	minus	minus	minus
0.5	5.83	5.63	5.42	5.21	4.88	4.31	3.70	3.05	2.36	1.62	0.82
0.3	10.94	10.74	10.53	10.31	9.99	9.41	8.81	8.16	7.47	6.73	5.93
0.1	21.93	21.72	21.51	21.30	20.97	20.40	19.79	19.15	18.46	17.72	16.92

$\alpha = 0.2$

$\lambda\backslash\pi\beta$	0.99	0.97	0.95	0.93	0.9	0.85	0.8	0.75	0.7	0.65	0.6
0.8	0.07	minus	minus	minus	minus	minus	minus	minus	minus	minus	minus
0.7	0.73	0.63	0.53	0.42	0.26	minus	minus	minus	minus	minus	minus
0.5	2.42	2.31	2.21	2.10	1.94	1.65	1.35	1.03	0.68	0.31	minus
0.3	4.97	4.87	4.76	4.66	4.49	4.21	3.90	3.58	3.24	2.87	2.47
0.1	10.46	10.36	10.26	10.15	9.99	9.70	9.40	9.07	8.73	8.36	7.96

$\alpha = 0.5$

$\lambda\backslash\pi\beta$	0.99	0.97	0.95	0.93	0.9	0.85	0.8	0.75	0.7	0.65	0.6
0.6	0.00	minus	minus	minus	minus	minus	minus	minus	minus	minus	minus
0.5	0.37	0.33	0.28	0.24	0.18	0.06	minus	minus	minus	minus	minus
0.3	1.39	1.35	1.31	1.26	1.20	1.08	0.96	0.83	0.69	0.55	0.39
0.1	3.59	3.54	3.50	3.46	3.39	3.28	3.16	3.03	2.89	2.74	2.58

Table VII.5. Values for W/N for given values of parameters, using (7.9)

	W/N					t_0				
p	0.01	0.05	0.1	0.15	0.2	0.01	0.05	0.1	0.15	0.2
λ	α = 0.05 and π = 0.95									
0.8	0.102	0.072	enf	enf	enf	2	1	<1	<1	<1
0.7	0.211	0.173	0.129	0.091	0.061	4	4	3	2	1
0.5	0.433	0.393	0.349	0.309	0.272	11	10	9	9	8
0.3	0.655	0.615	0.570	0.528	0.491	21	21	20	19	18
0.1	0.878	0.836	0.790	0.747	0.709	43	43	42	41	40
λ	α = 0.05 and π = 0.85									
0.7	0.121	0.104	enf	enf	enf	2	1	<1	<1	<1
0.5	0.363	0.323	0.277	0.237	0.200	9	8	7	6	5
0.3	0.613	0.570	0.522	0.479	0.440	19	18	17	17	16
0.1	0.863	0.817	0.766	0.721	0.680	41	40	39	39	38
p	0.01	0.05	0.1	0.15	0.2	0.01	0.05	0.1	0.15	0.2
λ	α = 0.2 and π = 0.95									
0.6	0.224	0.186	enf	enf	enf	1	1	<1	<1	<1
0.5	0.319	0.300	0.256	0.217	0.182	2	1	1	1	1
0.3	0.570	0.528	0.481	0.439	0.403	4	4	4	4	3
0.1	0.842	0.795	0.743	0.697	0.656	10	10	9	9	9
λ	α = 0.2 and π = 0.85									
0.5	0.272	0.234	0.192	enf	enf	1	1	1	<1	<1
0.3	0.503	0.465	0.418	0.376	0.339	4	3	3	3	3
0.1	0.812	0.762	0.706	0.658	0.616	9	9	9	9	8
p	0.01	0.05	0.1	0.15	0.2	0.01	0.05	0.1	0.15	0.2
λ	α = 0.5 and π = 0.95									
0.3	0.370	0.337	0.299	0.265	enf	1	1	1	1	<1
0.1	0.627	0.588	0.545	0.506	0.472	3	3	3	3	3

In our opinion, debtor reputation effects are important because they will be weaker in Russia than in developed market economies. First, in transition economies like Russia, there are obvious reasons to postpone payment, other than insolvency, and therefore non-payment will affect reputation less. There is only very limited information about the true reason for non-payment. Is there a temporary liquidity problem or is there a problem of viability ? It is hard to tell and making the wrong choices in this respect may be harmful. Given the uncertainty about the quality of the debtor, one must also take into account that creditworthy debtors are scarce in transition countries. It is far from sure that the resources drawn - possibly unjustified- from enforcement can be allocated to a debtor of better quality, so the enforcement loss may be in vain. Second, the often reasonable **expectation of future bailout** of bad debtors prevents the functioning of reputation mechanisms. It makes sense for a creditor not to enforce upon bad debtors but to expect payment in future periods because past bailouts have proven the effectiveness of such policies. We can consider this as the moral hazard problem caused by bail-outs during restructuring. Moreover, the probability of such bailouts is positively related to the maturity and the scale of the bad loans. Therefore it may be rational for creditors, that are too big to fail, to hold as many bad loans as possible because this threatens the viability of the creditor and therefore will cause a government bailout. In short : The decreasing probability of payment by the debtor may be (partially) compensated by an increasing probability of bailout. Last, one should realise that some categories of loans carry **implicit government guarantees** (defence industry, agriculture,...), impeding reputation effects. For these reasons reputation effects will ceteris paribus be weaker and thus optimal waiting will be longer in transition countries.

2.4. The complicated world of multiple creditors and debtors

2.4.1. Creditor reputation effects versus signalling effects

Until now we have approached creditor inactivity with a model that considers one debtor and one creditor. However, creditors operate in an environment with multiple debtors and multiple creditors. This introduces some new aspects.

First, there is an **adverse creditor reputation effect** of waiting. If a creditor is tended to wait according to the microeconomic incentives set out in section 2, he may be classified by debtors as a non-enforcer. This knowledge will influence the behaviour of debtors. Debtors will use the information and pay non-enforcing creditors later than enforcers. Technically we can introduce this into the model by making the probability π_0 dependent on waiting behaviour of the creditor in past periods. One can interpret this as an adverse selection phenomenon. Weak enforcers will attract bad debtors and strong enforcers will attract good debtors for two reasons. The main reason is that, if debtors observe a possibility to postpone payment without punishment, they will certainly do so, even if they are viable. As a consequence, bad loans attract more bad loans. The second reason is that enforcers who have less bad loans in their portfolio will be able to offer credit at lower interest rates (see chapter VI). Lower loan rates in combination with high collateral, attract investment projects with lower risk and thus on average better debtors to the extent that their projects have a lower probability of default. This will encourage creditors to enforce, even if this is not rational from the microeconomic point of view, because tough reputations are brought to a more than rational extent by enforcement.

On the other hand enforcement also has a negative impact on the creditor because it functions as a **signal of his own viability**. Enforcement involves a public announcement of the existence of bad loans and thus lowers the value of the creditor's capital in the perception of the public. This can have adverse effects in two ways : Savers can either withdraw their savings or require higher interest rates to compensate the observed higher risk, as shown in chapter III. Bad debtors will be attracted because they expect creditor insolvency and therefore will postpone the payment of the debt in order to get their loan for free.

2.4.2. The trade-off

On the macro-level, there is a trade-off between the adverse creditor reputation effect of waiting and the adverse signalling effect of enforcement. This reaches far beyond the ratio of the simple case.

It is hard to put this intuition into a model. Let us assume that we are in an equilibrium without enforcement. The adverse creditor reputation effect of waiting is low because everybody is waiting anyhow. The adverse signalling effect of enforcement is considerable because it deviates from the equilibrium. The creditor who tries to enforce will be punished by both savers and debtors. **Therefore, one can see that an economy with a large problem of bad loans can be trapped in a non-enforcement Nash-equilibrium**. Given the behaviour of other agents, no agent can be better off by deviating from the non-enforcement trap. This is a bad equilibrium, because non-enforcement has several adverse effects on the economy.

There exists however another equilibrium. If enforcement would start on a large scale, then the effects are reversed. Adverse reputation effects of non-enforcement would grow. Indeed the reputation to be a non-enforcer can be damaging if all other creditors enforce, because bad debtors will be attracted and rational savers deterred. On the other hand the adverse effect of signalling would decrease or even be reversed, since enforcement would not be a signal of insolvency any more (everybody is enforcing anyway). So we arrive at a better **enforcement Nash-equilibrium**.

We can clarify these points by setting out a very simple game. Let us assume that we have three creditors: I, II and III. If nobody enforces, all players receive 0. If only one player deviates from non-enforcement, he will be punished by savers and debtors (the signalling effect dominates) and he will receive -1. His lost payoff is equally distributed among the other players. On the other hand, if all players enforce then they all receive 1. This represents the fact that non-enforcement has adverse effects. If only one player deviates from enforcement he will be punished by debtors and savers (the reputation effect dominates) and he will receive 0. This game is presented in figure VII.1.

It is clear that the game has two pure Nash-equilibria, namely (NE,NE,NE) with payoffs (0,0,0) and (E,E,E) with payoffs (1,1,1). Transition countries all start from the non-enforcement equilibrium, because of the initial absence of bankruptcy legislation, procedures and experience. This legislation appears in all transition countries, however waiting is prolonged. This can be understood by the simple game set out here. Transition countries are trapped in the non-enforcement Nash-equilibrium and it is not simple to escape from it. Therefore (NE,NE,NE) is the typical pre-transition equilibrium.

Figure VII.1. The trade-off between signalling effects and reputation effects

| | | Enforce III Not enforce | | |
| | | II | | II |
		Enforce	Not enforce	Enforce	Not enforce
Enforce I		(1;1;1)	(1.5;0;1.5)	(1.5;1.5;0)	(-1;0.5;0.5)
Not enforce		(0;1.5;1.5)	(0.5;0.5;-1)	(0.5;-1;0.5)	(0;0;0)

2.5. Policy implications

In 1994, Russia was most probably stuck in the non-enforcement equilibrium. The question is whether the country has remained there during the last years. How could a country like Russia shift to the enforcement equilibrium? The measures that induce the micro-incentives for enforcement have been set out above. However the **Nash-equilibrium functions as an additional barrier to enforcement and neutralises the positive effect of the changed micro-incentives**. It may therefore be unsatisfactory to change only the micro-incentives.

What can the Russian government do to stimulate enforcement? The model suggests that the micro-incentives must be changed. In this respect the optimal policy seems to involve investment in jurisdiction and bankruptcy legislation (raise λ), and the introduction of debtor reputation effects. The main reason for the absence of debtor reputation effects in 1992-1994 was the expectation by creditors of future bailouts by the state budget by means of subsidies and DC. The best way to break these expectations is to continue the stabilisation policy that has been pursued in recent years.

However, the portfolio of bad loans in Russia may have such proportions that positive micro-incentives to enforce will never push banks over the barrier of the non-enforcement Nash-equilibrium. Therefore the government must solve the problem of creditor reputation effects and signalling effects. The optimal policy to leave the bad Nash-equilibrium seems to be a combination of several measures. First, the government should commit to a credible **once-and-for-all recapitalisation of large banks**. This would reduce the adverse signalling effect of enforcement, for after the bailout, enforcement will not be a signal of insolvency (the bank has only just been bailed out), and it would introduce creditor reputation effects. The 'once-and-for-all'-character also generates debtor reputation effects at the micro-level, since the expecta-

tion of future bailout is reduced. Second, there must be **strict regulation and supervision of banking activity**. Strict bank supervision will ensure that the level of both capital (in relation to risk weighed assets) and loan-loss provisions are adequate. Last, **properly priced deposit insurance** will soften adverse reactions of savers on enforcement by their bank and will stabilise the system.

However this combination could only be a successful policy if the micro-incentives for enforcement are in place. Thus, if there is no **satisfying system for enforcement at low cost**, then the 'once-and-for-all bailout' will not be credible. Every creditor will understand that enforcement costs are too high to incite other creditors to enforce and that therefore enforcement will be the deviating and punished strategy. Creditors rationally expect the re-emergence of bad loans and the subsequent bailout, because the 'once-and-for-all'-policy would be time-inconsistent for the government. Therefore the bad Nash-equilibrium will realise. This is precisely what happened in Russia. The 1992 inflation shock was in a way a massive bailout of banks. However, there was no operational system for enforcement at low cost in place and building it might be a matter of decades. As a consequence, bad loans quickly reemerged and the bailouts were repeated by means of large swings of CCR and DC to banks. A once-and-for-all bailout could never be credible in Russia any more. Therefore the only option for Russia might be to bite the bullet and continue the hard stabilisation-oriented monetary policy, together with the introduction of strict prudential bank control and properly priced deposit insurance. This creates a process of natural selection and will in the long run urge the surviving banks to start working on their bad loans. This has however not happened to a significant extent yet.

Note also that **a stable macroeconomic environment in itself does not solve the problem of creditor inactivity** if the micro-incentives to wait are not altered, and if the moral hazard problem is not solved. Our estimates indeed point out that stabilisation without well-functioning bankruptcy procedures nor debtor reputation effects, will only aggravate the problem of creditor inactivity. The importance of moral hazard has sufficiently been shown in the L&S crisis in the U.S. Only stricter bank regulation, bank supervision and properly priced deposit insurance can counter the problem of moral hazard. In order to minimise moral hazard problems during transition, the burden of the 'once-and-for-all' bailout has to be shared by banks, enterprises and the central budget. The most simple way to achieve this is by embedding the solution of creditor inactivity in a program of general restructuring of both banks and enterprises (see Schoors, 1995).

3. The influence of banks on enterprise decisions through ownership relations

3.1. General

Above we showed that one should not expect too much involvement of banks in corporate governance through loan work-outs, debt-equity swaps or procedures. In general banks are passive creditors. However, they might be involved in corporate governance through the enterprises they own. This is supported by the results of a World Bank survey of Russian enterprises, as reported in Fan, Lee and Schaffer (1996). These authors find that bank shareholdings seem to be a much better indicator of banks' influence on enterprises than bank loans. Therefore we will overview enterprise ownership by banks and its effects on banks' influence on these enterprises.

We have seen that many banks have developed as pocket banks. Indeed many small banks are pocket banks that do not own enterprises but are on the contrary owned and governed by the enterprises that founded them. These enterprises often founded these banks to reap some of the speculative benefit of the financial bonanza of 1992-1994. There also was an opposite tendency. Most of the larger banks had founded their own enterprises, often in service sectors such as trading, real estate, broadcasting or the written press, but also in light industrial sectors. Inspection of the annual reports of some of the biggest banks learned that these had indeed engaged in other activities than banking. Our focus however is on the role of banks in corporate governance of existing enterprises and the positive role banks may play in enterprise restructuring. Therefore section 3.2. pays attention to the role of banks in the privatisation process. Many larger banks have been acquiring minority stakes in enterprises in the course of mass privatisation. In recent years banks have taken control over many enterprises by acquiring additional stock from the original owners, mostly insiders (employees or management). Section 4 describes how a considerable number of banks founded or joined financial-industrial groups (FIG) that are conglomerates of large primary or secondary sector enterprises and banks. These FIG have arisen all over Russia and they have recently grabbed large stakes in the privatisation of strategic enterprises.

3.2. The active role of banks in the privatisation process

3.2.1. Chaos in corporate control before privatisation

In the very first phase of reform, between 1987 and mid-1993, enterprises were essentially **manager-controlled**, because the system of corporate control by the state collapsed without being replaced by a new system. The unstable economic and political environment, uncertainty about property rights and the complete absence of any control on the enterprises, stimulated the enterprise managers to maximise their short term personal wealth. As a consequence asset stripping and spontaneous privatisation (see Johnson and Kroll, 1995) reigned all over the country. Asset stripping refers to a process where managers abuse enterprise resources (money, the best machinery, skilled workers) to their own benefit. Åslund (1994b) notes :

> "Part of the problem is that workers do not really count in the workplace, contrary to popular perceptions. Managers are supreme to an extent unknown in the West. From 1989 until mid-1993, hardly any state enterprise managers were fired in Russia, allowing them to be criminally negligent of their workers. In August 1993, when monetary policy was loose and enterprises awash in money, only 56 percent of workers polled had received their latest monthly wage in full and on time. A common complaint is that the managers give themselves extraordinary salaries and fringe benefits. Much of Russia's capital flight appears to have gone from state enterprises to their managers."(Åslund, 1994b, p.67).

Often new privately-owned enterprises were set up with the best enterprise resources and the mother enterprise was left with outdated equipment and no money. Banks were only just emerging and were not able to exert effective control. Creditor inactivity prevailed.

3.2.2. Voucher privatisation

The state realised that the only way to escape from this chaos was fast privatisation. The design of Russian mass privatisation was particular. We will devote our attention solely to the aspects of our interest. The law provided three privatisation options, between which workers and managers had to choose. These are described in many sources. Our description draws heavily on Boycko, Shleifer and Vishny (1994). In the first option workers got 25% of shares for free but without voting rights, while management got access to 5% of equity with voting rights, at the nominal (often very low) price. Managers and workers could buy another 10% at a special beneficial price to acquire another 10% at a low price. In the second option the insiders (managers and workers) bought 51% of the shares at a price of 1.7 times the July 1992 book value, which was ridiculously low, due to high inflation. Moreover payment for this 51% did not have to be settled in cash, but could also be settled with vouchers or with some of the retained earnings of the enterprise. In addition, insiders could acquire another 5% at low prices. There was also a third option, but explaining it is not very useful, since it was not used in practice. Since insiders decided which option would realise, it is no wonder that the second option, which is the most beneficial to insiders, was by far the most popular method of privatisation.

Once insiders made their choice on a variant, they could submit a privatisation plan that provides a plan for the selling of the rest of the shares. On average 20%-30% of equity was sold in voucher auctions. In these auctions shares were sold to the highest bidder. The price was however not paid in cash but in vouchers. These vouchers were the basic unit of account and payment at privatisation auctions. They were distributed for free to all citizens of the Russian Federation born before the 30th September of 1992. During four months (October 1992 till end January 1994) roughly 144 million vouchers were distributed (Chubais and Vishnevskaya, 1995). Vouchers had a nominal value of 10,000 rubles, but this nominal value was not related to the value of the voucher in an auction.

Vouchers were transferable financial instruments. Between their emission and their final expiration on 30 June 1995, a large secondary market in vouchers emerged. Prices on the secondary market were highly variable and were quoted by several Russian newspapers. Many of the current brokers started their career by trading vouchers, which were the first homogenous and highly liquid financial instruments on the Russian market. The transferability of the vouchers also facilitated the genesis of investment funds that bought vouchers from the population, to invest them in shares during the auctions. As a matter of fact the Russian legislation created a special investment fund that would receive vouchers from individuals and invest them on their behalf (Chubais and Vishnevskaya, 1995). These funds were at that time the Russian version of mutual funds. In exchange for the vouchers received, the voucher investment funds issued shares that could be freely traded. These investment funds were a big success in Russia. Many of the large investment funds were founded and dominated by large banks. In this way banks were able to acquire minority stakes in a large number of enterprises. But besides the voucher funds, any individual or organisation could purchase vouchers on the secondary market and invest them in equity of privatised enterprises. This was a good opportunity for strong outside investors, such as liquid banks, to acquire stakes in the enterprises of their interest.

Due to the predomination of the second privatisation option, the stakes to be acquired were initially only minority stakes. Indeed, the second option implies that insiders have at least 51% of equity. This approach induced **worker-ownership and insider-ownership at a large scale**. In addition most of the voucher auctions were not as transparent as one could ideally have wished[3]. So, in some cases the auctions even reinforced the dominant position of managers. In practice managers developed several mechanisms to ensure control over their company and their position was only weakly affected by the mass privatisation (Gurkov and Asselbergs, 1995 and many others). This seriously hampered the scope for any outside control by banks or other outside investors in the short run and left the task of restructuring to the enterprises themselves. Data also show that involvement of banks in voucher privatisation was rather limited. This is no wonder, given the enormous proportions of the mass privatisation process.

Many of the newly privatised firms got stuck in an excess labour equilibrium. Firing workers was close to impossible and there was strong pressure by workers to substitute wages for investment or in general to substitute short term benefits for the long term viability of the firm. One finds clear indications of this in macro-economic statistics[4], as was to be expected. Even in ideal circumstances with cooperative, rational and forward-looking worker-owners, worker-owned companies would be more risk averse than other firms, since worker-owners have invested both their human capital and financial capital in the same firm. This lack of portfolio diversification naturally stimulates risk averse behaviour. Moreover the structure of the social system is enterprise-based. Even if a certain enterprise would pay its workers very badly, it may be worthwhile to be officially employed by that enterprise, because of the social benefits associated with employment.

The unwillingness to restructure could only exist by grace of the soft budgets that prevailed in 1992-1994. We showed throughout this work that budgets have gradually hardened in the period under study. Growing market discipline ultimately forced enterprises to seriously undertake restructuring. In that case they might need to accept outside control by banks in the long run. Indeed, practice has shown a number of friendly and hostile take-over bids of enterprises by banks. In this case banks had to convince insiders to sell their stake in the enterprise to the bank. Therefore the main advantage of voucher privatisation seems to be that it established private property on a nationwide scale. As a consequence, enterprises can now be bought and sold, which in a market economy increases the efficiency of enterprises in the long run regardless of the initial distribution of the property rights.

3.2.3. Growing scope for outside control after privatisation

The hardening of budget constraints for both banks and enterprises forced enterprises to compete for bank loans and urged banks to engage in monitoring and screening of projects and entrepreneurs notwithstanding the initial subordinate position of banks and the widespread problem of internal lending. A lot of banks were facing serious liquidity problems by end 1995 and started to reorganise loan portfolios[5]. This shows creditor inactivity came to its end. Apparently banks realised that the times of soft credits were over.

Banks are gradually acquiring more enterprise stock in different ways. A lot of banks were involved in the voucher privatisation through their own voucher funds and acquired minority shares in the privatisation auctions. After privatisation, these banks increased their holdings.

One of the favourite methods is approaching individual workers directly and offer to buy the stock. In this way many banks have acquired majority positions in a number of firms. In the economic press and in a lot of books we find a series of such hostile take-overs of enterprises by banks. In most cases such take-overs are followed by major reshuffling of the management team. Often the bank places its own representatives at the head of the firm. In several cases part of the existing middle management teamed up with the outside investor to dispose of the old top management and the restructuring process. Many important industries have become dominated by banks or bank groups. Often we observe that banks give large proportions of their loan portfolio to enterprises they control directly through ownership links. Indeed ownership seems to be the only workable method to avoid the large information problems banks face in the process of screening and monitoring.

4. Financial-industrial groups

4.1. General

Banks and enterprises have increasingly engaged in financial-industrial groups (FIG). These FIG are founded for several reasons and allegedly offer several advantages to their members. The Russian economic literature distinguishes several types of FIG. The crucial types of FIG are regional FIG, sectoral FIG, and FIG centred around a financial group or a bank (Starodubrovskaya, 1995). Regional FIG group a number of regional enterprises and banks and are usually well-diversified. Sectoral FIG were often founded on the remainders of the old branch ministries that were abolished in 1992, but in some cases rose from their ashes in the form of sectoral FIG. Often these connections are based on old connections. Last but not least, capital that was initially concentrated in the financial sector, gradually spread to the production sector. This was not only the case for the large Moscow-based banks, but also for small and medium regional banks. This is not unusual. Gerschenkron (1962) and Cameron (1972) showed that in developing countries banks often actively seek for profitable investment opportunities in industry or trade. Some authors also mention the existence of FIG that were founded to implement certain investment projects (Gorbatova, 1995).

One can also distinguish between defensive and offensive FIG[6], where defensive FIG are based on old connections and structures and aim to as much as possible keep the advantages and soft subsidies of the old system. Offensive FIG are entirely new groups that have found each other on the basis of common interest and strategic prospects. Russia has created a legal framework for FIG. There is however no direct relation between officially registered FIG and FIG in general. Every serious bank has been involved in some kind of FIG, but most banks were very reluctant to join officially registered FIG, because the law on FIG initially was not very restrictive with respect to the rights of participating banks, as shown in the next section.

4.2. The legal framework

The Russian government promoted the formation of FIG, because it hoped that this would stimulate productive investments by these groups, financed by long term loans from the concerning house-banks. The government created a legal framework for these FIG[7]. This decree considered three possibilities to found and officially register FIG, namely intergovernmental agreements, decisions by the board of ministers and deliberate foundation by a number of

enterprises. Only the last category is relevant for our research. The law is both a blessing and trouble since it provides **privileges** for officially registered FIG at the cost of some serious **restrictions** imposed on them. Article 5 of the decree for example stipulates that FIG could receive stock, currently held by the state, of enterprises that become members of FIG, enjoy debt relief and receive state guarantees to attract investment resources. However the provisions added to the law mention in article 7 that holding companies (defined as companies with more than 50% of assets non-material) are barred, cross-holdings are forbidden, banks and financial institutions are not allowed to control more than 10% of the stock of an other enterprise-member, and may not invest more than 10% of their assets in stock of enterprise-members. Article 8 of the provisions specifies a complex bureaucratic approval procedure.

In general, the provisions of the law shed light on the underlying strategy of the state. The state wanted to keep the process under control and preferred that industrial enterprises and not banks would be the cornerstone of the FIG. This seems to be an echo of old times, when associations of industrial enterprises formed the hard core of the planned system, with banks merely playing a passive role. To many banks the restrictions on their involvement in the FIG and the bureaucratic registration procedures seemed to be larger than the promised benefits. Therefore the number of FIG was initially small. Only in 1995 the number of FIG reached a significant level, as shown in table VII.6.

The government had to give in and the law on FIG was frequently changed in favour of the banks, which were allowed to assume a more central position in FIG. Mizobata (1995) gives an overview of the flow of legislative acts that concern the establishment of FIG. In table VII.7 we give an indication of the involvement of the largest Moscow-based banks in registered FIG. The reported banks are the non-state top-10 banks according to their assets by end 1996. We chose the non-state banks, because the successors of state banks are more likely to engage in FIG and are more inclined to submit to government pressure. The non-state banks are more independent. SBS-bank was the only bank that was not engaged in an official FIG, but it certainly had an unofficial FIG of its own. Later, this bank merged with the remainder of Agroprombank and became one of the largest private banks in terms of branch network.

Table VII.6. Officially registered FIG

Year	Number of registered FIG	Number of enterprises	Number of financial institutions	Total charter capital	Number of employees	As % of total employment
1993	1	16	4	3,731	46,000	0.06%
1994	7	96	21	25,938	387,160	0.57%
1995	26	395	73	208,142	2,260,710	3.40%
Oct 1996	43	600	103	267,675	2,588,740	3.93%
Source : Association of FIG						

Table VII.7. Involvement of the main private banks in important official FIG

Name of bank	Name of FIG	No. of employees of FIG
Oneksim	Interros	306,000
Inkombank	Marine Technology	14,000
	Nosta-Pipes-Gas	59,100
Menatep	Eksokhim	54,800
Rossiyskiy Kredit	Svyatogor	49,700
	Tochnost	54,500
	Ruskhim	86,000
Stolichniy Savings Bank (SBS)	-	
International Financial Company	Interros	306,000

Source : selected from data of Association of FIG

4.3. Financial-industrial clustering outside official financial-industrial groups

The subject of this section is beyond our period of study and will therefore be very concise. Most banks and enterprises voluntarily formed unregistered FIG with the banks at the heart of the group but without applying for the official status. We stressed throughout this work that many banks were in reality pocket banks founded by and for the benefit of the founding enterprises. So, quite a lot of banks are members of financial-industrial groups in a subordinate position.

However, in 1995 another trend came to the surface. Many of the larger banks -that were often member of one or more of the officially registered FIG- had apparently been organising independent financial-industrial groups with themselves at the centre. Activity on the level of officially registered FIG did not prohibit these large financial groups to actively found their own FIG. The large banks deliberately engaged in the formation of groups of enterprises and banks that strongly remind us of the Japanese system of zaibatsu, because of the often very close relation between these banks and the enterprise sector.

We want to mention however, the particular role played in financial-industrial clustering by the shares-for-loans programme of late 1995 and by the case-by-case privatisation strategy (cash sales or investment tenders), implemented by the state after 1994. These programmes facilitated the acquisition of important stakes of shipping, metallurgy, oil, gaz, primary resources and other cash generating industries by the large Moscow-based bank groups. Our description will be short, because the programmes are beyond our period of study.

First, we concentrate on the shares-for-loans deals of end 1995. Under this scheme large banks and financial groups could gain control over packages of shares of valuable state-owned enterprises in return for loans granted to the government. The loans were used to cover the 1995 budget deficit. More specifically, the government defined the share packages that fell under the scheme and organised auctions at which banks and financial consortiums could bid for these packages. The highest bidder had to pay the government the offered loan and received control over the shares. However, this control was in theory temporary. The government could choose to redeem the loans before September 1, 1996 and regain control over the

shares. So, the stock was only collateral. In practise the government chose not to redeem the loans. In that case the banks had the right to organise the sale of the shares in their possession. The banks organised the sales in a way that ensured them the control at minimal cost. They did so by imposing investment and other complex technical requirements. The difference between the original loan and the price received at the sale was divided between the government and the selling bank at a proportion of 30% for the government and 70% for the bank[8]. Table VII.8. gives a summary of the deals made under the shares-for-loans scheme. Note that some of the banks that were very active in officially registered FIG, such as Inkombank or Rossiyskiy Kredit, were excluded from the shares-for-loans scheme. This is one more indication of the limited importance of the officially registered FIG. It is also typical that all banks seem to have a specialisation, a sector they give most attention to. But on the other hand the main oil industries seem to have been distributed among the main banks by some form of consensus. Competition in these shares-for-loans deals was very limited anyway.

Table VII.8. Shares-for-loans auctions and sales

Company of share packet	Winner of Auction	Size of Stake (in %)	Loan (mln $)	Purchaser	Price (in mln $)	Required Investment
Yukos	Menatep	45	159	Menatep	160.1	200
Sidanko	Oneksim	51	130	Oneksim	129.8	161
Surgutneftegaz	Surgut	40.12	88.3	Surgut	78.8	193
Sibneft	SBS-Agro	51	100.1	FNK	110	
Lukoil	Lukoil	5	35.01	Lukoil	70	
Norilsk Nickel	Oneksim	38	170.1	Svift	250	300
North-West River Shipping	Oneksim	25.5	6.05			
Chelyabinsk Metallurgical	Imperial	15	13.3			
Murmansk Shipping	Menatep	49	4.13			
Novolipetsk Metallurgical	Oneksim	14.84	31			
Novorossiysk Shipping	Oneksim	45	22.65			
Source : RET, various press reports, updated till September 1996						

Three types of companies fell under the scheme, namely natural resources companies (oil, gaz, nickel etc.), shipping companies and metallurgy enterprises. The purchasers in the final sales (that started in December 1996) were always the organiser of the auction or an affiliated enterprise, as in the case of Svift or FNK.

Another privatisation related phenomenon is the case-by-case privatisation of large enterprises by means of investment tenders. This was the approach of the government after the voucher scheme privatisation in 1992-1994. Stock in a lot of strategic enterprises was put on the block. The purchasers that won the auction were in all cases FIG with one of the large banks at the centre. Lately, some of the large banks have founded joint ventures with Western and Russian partners, with the purpose to participate in the privatisation process.

Around some of the largest banks, strong and diversified financial-industrial conglomerates have emerged. These may centralise enough power and financial strength to undertake the major task of industrial restructuring. Well-known examples of such banks are in order of

magnitude : Oneksimbank, Inkombank, Rossiyskiy Kredit, SBS-bank, Menatep, Natsyonalniy Reservniy bank, MFK, Most-bank, International Moscow Bank, Avtobank, Imperial, Toko-bank, Gutabank and Alfabank (see Freinkman, 1995; Mizobata, 1995; Petrenko 1996; Huet, 1997; OCDE, 1997, and a large number of reports in the financial economic press). These are all large Moscow-based banks that are genuinely private and operate nationwide. The key point is that these banks are 'putting their money where their belly is'. Indeed, the lion's share of their loans has gone to enterprises under their control. Also these banks have learned to monitor investment projects. OECD (1997) reports that by end 1997 the 22 largest commercial banks (Sberbank excluded) had a ratio of bad loans to total loans of 2.9%, while the rest of the banking sector had an average ration of 20.8% and Sberbank 21.4%. This proves that these banks have worked out their bad loans and are able to select creditworthy projects. It also shows that the rest of the banking sector is still stuck in the non-enforcement equilibrium described in chapter VI. Hence in 1997 the role of banks in corporate control was still very limited with the exception of the credits allocated by large Moscow-based banks and of credits to enterprises that are controlled by banks in general.

We will not analyse these financial-industrial groups in detail, because they are beyond the focus of this study. Information about them is widespread, even in the Western economic press. Besides these large conglomerates, a number of small or medium-sized and less well-known banks have also formed FIG. Indeed a lot of small and medium-sized banks have also engaged in industrial activities. Some of these banks have performed reasonably well, while others underperformed and failed. In the long run the performance of these small banks is important to Russia. In January 1997 these small and medium-sized banks were still allocating 39.1% of credits, while the 22 largest banks were allocating 59.8% of credits.

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We conclude that the role of banks in corporate governance was initially limited, but is now growing. Some of the key industrial sectors are now controlled by large FIG that are actively restructuring their enterprises. Small and medium-sized banks are doing much the same with small and medium-sized enterprises, but they are on average doing it less effectively. Nevertheless the majority of firms will remain controlled by insiders in the near future. They will have to restructure themselves without outside control other than the struggle for life on Russia's rough markets. Unfortunately most of these enterprises will be forced to rely on retained earnings to finance restructuring, since investment finance from banks will be scarce in the near future for enterprises that do not belong to a financial-industrial group of any kind. In this sense banks have seriously failed in their function as intermediary between savings and investments. If these firms are not successful in restructuring they will eventually be forced to accept outsider control or cease operation. In other words : Restructuring is in the end inevitable even for insider-controlled enterprises. The restructuring process would have been more efficient however with a banking system that intermediates between savings and investments without discrimination on the basis of ownership links. This would however require better information, and a workable system of bankruptcy procedures. Without these, efficient allocation of loans to outside companies may be hard to achieve.

Notes of chapter VII

1. Simulations show that choosing $\alpha > 5$ makes no sense, because the weight is immediately very close to zero, which amounts to immediate enforcement. Appropriate values for α are between 0 and 5.

2. Bankruptcy legislation was put in place in May 1993, but was not operational even in 1994. Even now the number of bankruptcies is extremely low and bankruptcy is certainly not a standard procedure.

3. An interview with a high official in the privatisation department of the Ministry of Finance made clear to me that in general the privatisation auctions were pretty closed and in many cases reinforced the position of management which apparently abused its informational advantage over workers and outside investors.

4. While GDP decreased with more than 50%, official unemployment never reached levels above 10%. In December 1995, Mr Prokopov, director of the federal unemployment service, put forward that, according to ILO criteria, only 8.2% of the working population was unemployed, while only 2.9% were registered with the federal Employment Service. He predicted that the actual unemployment rate would rise to 9.5% in 1996 and 10.8% in 1997 (OMRI Economic Digest, Vol. 1, No. 8, 21 December 1995, p.2).

5. I found indications of this in an interview with collaborators of Stalitsa, a firm that specialised in solving problems of arrears. Already in early transition emerged some organisations that offered to settle arrear problems. Originally they were mainly situated in the criminal sphere but together with stabilisation emerged some firms that engaged in legal methods of arrear settlement. The largest and by far the most respected of these firms is the concern Stalitsa, founded in March 1994. In an interview with the collaborators of Stalitsa in their headquarters in Moscow, I was told that initially the majority of client-creditors were industrial enterprises, but by the end of 1995 about 95% of the client-creditors were banks, much to the surprise of the Stalitsa collaborators by the way. Typically they are relatively small regional banks that got stuck with a pile of bad loans and, after firing initial management, the new management goes to Stalitsa to solve its problems. They made clear that they were talking about tens, if not hundreds of banks.

6. Starodubrovskaya (1995) refers to this as groups for development and groups for survival.

7. Decree No. 2096 of the President of the Russian Federation of 5 December 1993.

8. Russian Economic Trends, 1997, Vol. 6, No. 1, p. 151 and No. 2, p. 98.

Chapter VIII. Conclusions

In this work we analysed the genesis of a commercial banking system in Russia and its influence on the transition process. At first sight the commercial banking system appeared to be one of the successes of early transition. The former state banks were swiftly and silently privatised and the number of new private banks mushroomed. By end 1993 there were already 1360 banks operating in Russia. By end 1994 this number had grown with 1157 banks to a total of 2517 banks. Most of these banks were profitable in the period under study. The banks were crediting the economy mostly with short term loans, which is normal in a high inflation environment. Banks also seemed to be conquering the market for household deposits, with the market share of Sberbank crumbling from 90% to about 40%. Prospects were promising and stabilisation could seemingly only change things for the better.

However, analytical scrutiny uncovered a wide range of problems inherent to Russia's emerging banking markets.

The moderate success of banks in the intermediation between deposits and credits was largely artificial. In practice about half of the banks' credits to the economy were not financed by deposits, but by centralised credit resources. So the banks were to a substantial extent intermediaries between quasi-budgetary resources and enterprises, without real intermediation taking place.

The banks' initial success on the deposit market was threatened by a series of financial scandals and scams, which affected trust of the population in the commercial banks and reinforced the dominant position of Sberbank in the market for household deposits from mid 1994 on. The market share of Sberbank on the household deposit market has been growing since then. The share of deposits in GNP was rising in 1995 and 1996, but the share of commercial bank deposits in GNP was decreasing. This means that Sberbank was in fact crowding out the commercial banks of household deposits. As a consequence banks financed to a substantial and increasing extent with enterprise deposits. These enterprise deposits were mostly current accounts from affiliated enterprises and bore very low interest rates. Enterprises needed these accounts to settle payments. Payments were settled by banks slowly and inefficiently and banks derived quite some inflation tax from this. This is supported by the strong relation between the volume of enterprise deposits and bank profitability.

Banks also attracted a considerable share of their deposits in foreign currency. We found that currency substitution of dollars for rubles is a process that is well explained by rational behaviour. Depositors substitute currencies as a reaction to changes in the relative rates of return of the currencies concerned. They mainly react to inflation and exchange rate innovations. The insignificance of interest rates in this respect shows that the dollarisation is not only affecting rubles in their role of store of value but also in their role of transaction money. Indeed in 1992-1994 dollars were increasingly used as transaction money in daily life of many ordinary Russians. The analysis also indicates that there is some hysteresis in the dollarisation process, which means that the process will not be easily reversed. There is also some support for the thesis that overshooting behaviour is involved.

The CBR played an important role in deposit markets for several reasons. First of all, the CBR influenced the competition between ruble deposits and foreign currency deposits with its policy of required reserves. Sberbank, which is majority owned by the CBR, is exempt from these reserve requirements and has a huge competitive advantage there. Ruble deposits bore extortionary high reserve requirements, while foreign currency deposits bore no reserve requirements. This increased the cost of ruble deposits and urged the banks to substitute foreign currency deposits for ruble deposits. This brings us to a second sphere of CBR interference. The CBR supervises commercial banks. One of its main instruments to enforce its regulations is its right to grant and withdraw bank licences. Banks need a special licence to perform foreign currency operations. Banks that did not receive such a licence from the CBR suffer from a competitive disadvantage, compared to banks that have. We also note that the required reservation can to a certain extent be considered as a rough form of deposit insurance. If a bank fails, its required reserves with the CBR are used to cover the bank's liabilities.

We found that deposit interest rates are not only related to the bank's balance structure but also to the bank's reputation. Banks with a good reputation payed lower deposit rates. A related finding was that state banks apparently pay lower interest rates than other banks. For obvious reasons state banks have a good reputation with savers and they have the competitive advantage of inheriting a branch network. These findings were very significant across specifications. Remarkably, there was no positive relation between the interest rate offered and the deposit base collected. On the contrary, banks that offer higher interest rates are actually collecting less deposits. These findings are jointly explained by a simple theoretical model of deposit rationing. In this model depositors ration deposits with banks as a function of the reputation of the bank. The model describes the relationship between the deposit rate offered and the deposit base collected as a tradeoff between two opposite effects, namely the interest elasticity of deposit supply and the signalling effect of high deposit rates. High deposit rates signal the bank's difficulties to collect deposits and are not credible to depositors. This concept of deposit rationing is new in the literature and can possibly be extended to other transition economies and even to developing countries in general.

We also note that the reputation of a bank has nothing to do with its capitalisation. Apparently depositors did not realise that bank capital is a buffer that guarantees the safety of their deposits. This may be justified because equity of a bank may be much lower than capital announced in the books because of hidden problems with loan quality that lower the value of capital. Banks seem to realise that their capitalisation is not crucial to their reputation with depositors and have optimised their liability structure by substituting resources. The average cost of capital is fairly high in the Russian banking sector, due to high payout-ratios, while the cost of deposits is linked to the reputation of the bank. Therefore banks with a good reputation that realise that lower capitalisation would not affect their reputation, have maximised profitability by substituting deposits for capital. As a result, it is precisely the large banks with high deposit bases that have the lowest capitalisation. Therefore the first impression that undercapitalisation is not a major problem is unjustified. There is a problem of undercapitalisation looming in the biggest and most active banks. This may be the reason why some of these banks indeed collapsed.

It is important to underline the role of the CBR in the liability structure of banks. In the period under study banks were inter alia kept afloat by the CBR that injected a stream of CCR in the

commercial banking system. However this stream was drying up over time and became insignificant after 1994. So, hard budgets were introduced gradually and -which is more important- in a credible manner. Banks that could not cope with the hardening monetary policy and mounting supervisory control were not saved by the CBR. In fact the CBR let fail hundreds of banks, most of which were small, but some of which were rather big. This policy was clearly continued after 1994. At the time of the crisis on the interbank market in August 1995 for example, the CBR injected temporary liquidity in the market (by means of open market transactions on the GKO-market), but did not step in with structural support for banks. In the aftermath of the crisis more than hundred banks that had lost out during the crisis, went bankrupt. Some of these banks were fairly big. The CBR did not intervene. In the summer of 1996 very unexpectedly Tveruniversalbank -one of the top-20 banks- collapsed. Again the CBR did not intervene. This is remarkable, since this hardness is not observed in other Central European transition countries. Certainly not in Poland, Hungary or the Czech Republic, which are often referred to as examples for other transition countries. In these countries the large and loss-making state banks have been a serious burden to the budget throughout transition. In Russia this was not the case, because banks were privatised very early in the reform.

This hard position of the CBR also clarifies why rationing reigns in the Russian deposit market. Russia is one of the few market economies in the world where the value of deposits is in a realistic way threatened by the prospect of bank failure. In other market economies governments have commonly stepped in and protected depositors to avoid systemic problems. This was recently the case in large economies as for example the US, Japan and France.

Here we have arrived at the heart of one of the main problems of the Russian banking system. The functioning of a banking system as a delegated monitor for the account of the depositor constitutes the main rationale for its existence. If a banking system cannot guarantee depositors' safety, depositors exchange the monitoring of a project for the monitoring of a bank. In this case banks may be hardly more efficient than direct investment and the depositor may prefer to invest his money directly in a project and monitor the project. Banks will not be able to gather the savings of the economy and will not be able to play their efficiency enhancing role in the transformation of savings into investments. Therefore, the banking system cannot fulfil its role adequately as long as it cannot guarantee safety to its depositors.

It is bitter to realise that there did exist a window of opportunity for Russian commercial banks to conquer the deposit market. At the start of 1992 Sberbank held 90% of deposits. Its share quickly crumbled to 42.5% in mid 1994. Apparently Russian depositors initially had trust in commercial banks and were prepared to deposit money with them. This was promising and it appeared that commercial banks would indeed soon function as intermediaries between savings and investments. However the weak bank supervision and control of the CBR facilitated a series of financial scams and fraud by commercial banks. This seriously affected trust of depositors in the commercial banks, induced the deposit rationing phenomenon and announced the return of Sberbank as the dominating bank on the deposit market. By end 1996 its share was back above 70%. The initial and unique window of opportunity of depositor trust was spoiled by short term rent-seeking behaviour of some fraudulent banks and financial groups, the lack of a decent system of deposit insurance and the deficient bank supervision and control by the CBR.

There exists a combination of policies that could raise the trust of depositors in banks. First of all we need to stress the role of strict bank supervision, which seems to be in place right now, but was absent in early reform. The continued strict supervision of banks will eventually lead to a strong and healthy banking sector, with which savers are willing to deposit their money. Second, there is a huge need for an explicit and correctly priced system of deposit insurance, which could restore trust of savers. The implicit system of required reserves is of little use in this respect. But these measures will only restore trust of savers in the long run.

We note that some observers argue for a stratified banking system, with narrow banks that assume no risk and offer fully guaranteed but low interest deposits, and other banks that assume more risk. These other banks could be divided in several other risk categories. Our point of view is that Russia already has a stratified banking system. The narrow bank is Sberbank. It offers state-guaranteed but low interest deposits and invests to a large extent in treasury bonds. It is interesting to keep in mind that Sberbank deposits bear no required reserves. For Sberbank there is no implicit deposit insurance but an explicit state guarantee. We already observed that Sberbank started to fulfil its role as a narrow bank from mid 1994 on, and crowded commercial banks out of household deposits.

Another lost opportunity was the payment system. In early reform the payment system collapsed completely, due to a combination of incapacity of the hybrid system, inability of the agents involved and unwillingness of banks to settle payments efficiently. Banks earned quite some money by slowing down payments and keeping the inflation tax. Banks could do so because competition was initially deficient. However in the long run this affected banks adversely, because a lot of enterprises started to settle payments with cash or by barter, leaving banks out of the equation. Stabilisation and fast technical evolution presumably changed this situation after 1994, with an increasing volume of payments settled through bank transfers.

The CBR played an important role in the payments crisis. Its RKT-system formed the backbone of the payment system in early transition. However the system was not able to cope with the enormous flow of payments and documents in 1992 and worked very slowly. Interregional payments often took several weeks up to several months, which is very long in the high inflation environment of 1992-Russia. The collapse of the payment system contributed to the explosion of interenterprise debt in the summer of 1992. The subsequent clearing of this debt on its turn threatened the speed of the payment system in late 1992, early 1993. We also found indications that the inefficiency of the payment system (as measured by float money) was strongly related to interenterprise debt in 1993 and 1994. The inefficiency of the RKT-system urged commercial banks with large branch networks to enter the business of interregional payments. Indeed some of the large commercial banks became an important partner in the settlement of interregional payments. As a consequence the practice of W-type interregional payments emerged. In this system the RKT take care of the local transfers while the large private banks settle the interregional part of the payment.

Moscow became the payment centre of the country. This was due to the fact that there was a special and more efficient relation between RKT and banks in Moscow than in the rest of the country. Also the W-type payments passed through the large and Moscow-based banks. Last, an interbank money market is a prerequisite for a smoothly functioning payment system and the interbank market was best developed in Moscow.

Normalisation of the payment system was only achieved after 1994. The domestic payment system collapse in early transition contributed to the chaos and disarray in corporate Russia and was certainly not conducive to the transition process. In addition the interrepublican payment system also fell apart in the process of the disintegration of the ruble zone. As a consequence interrepublican trade collapsed, which meant a substantial loss of GNP to all CIS-countries. Many authors argue that the interrepublican trade structure was to change anyway in the context of transition, because the existing structure was an inefficient remainder of the Soviet industrial centralisation and location policy. We have however argued that this transition should have been based on deliberate responses of agents to changed incentive structures and not on a blind payment system failure. A comparison with the EPU shows that the loss of GNP was substantial all over the CIS. A payments union could have supplied a less painful transition of inter-CIS trade structures to market levels. This is not only feasible in a logic of dynamic integration, as in the case of the EPU in post-WWII Europe, but also in a scenario of managed disintegration. This is shown by the ECU-based clearing system, introduced temporarily at the occasion of the split of Czechoslovakia in the Czech Republic and the Slovak Republic. A suchlike payment union was indeed conceived and founded in the CIS, but it was never operational mainly because of political reasons. Unfortunately Russia was one of the countries that lost least GNP as a consequence of the payment system failure. Russia thus preferred its powerful position to the less powerful and only slightly more efficient one, implied by the proposed payments union. This is nevertheless another spoiled opportunity to soften the burden of transition in an efficient way.

A third aspect is the allocation of loans to the economy. We have observed that loans continue to decrease as a % of GNP from 1992 to 1996. Subtracting the share of CCR in these credits softens this phenomenon but still the basic conclusion remains : Banks allocate less and less credits to the economy over time. What is to blame for this unexpected phenomenon? We have already pointed at banks' difficulties to gather household deposits, the inefficiency of the payment system or the gradual hardening of budget constraints for banks and specifically the decrease of the flow of CCR from the CBR to the banks. Some argue that banks were squeezed by too hard a monetary policy and that this created a credit crunch.

We found that the gradual decrease of bank loans to the economy was not only due to credit crunch factors. The analysis of bank assets shows that by end 1994 banks were holding a considerable amount of excess reserves. These large and costly excess reserves could to a certain extent be explained by the inefficiency of the payment system, that forced banks to hold large reserves in order to remain liquid in the face of large and unpredictable variations in payment float. The hypothesis that banks were holding excess liquidity could however not be rejected either. Apparently banks preferred to hold liquidity instead of granting loans. This allows us to reject the credit crunch hypothesis. The fact that excess reserves were indeed liquidity reserves is also supported by the finding that banks have been substituting GKO for excess reserves. This fits in a scenario where banks increased the efficiency of liquidity management and swapped zero interest excess reserves to interest bearing treasury bills.

Increases in treasury bill holdings were not completely offset by lower excess reserves. This means that the introduction of GKO urges banks to hold even more liquidity, which is rational, since GKO increase the rate of return of holding liquidity. These facts fit in a theoretical scenario where banks prefer to accumulate reserves instead of granting loans. Berglöf and

Roland (1995) propose a model that predicts this behaviour as a reaction of banks in an economy with systemic loan quality problems.

Credit allocation was facing a plethora of problems in early transition. Investment credit was not available, credits were mainly short term and banks were demanding overcollateralised loans. Overcollateralisation may have adverse selection effects, since small and medium-sized enterprises are crowded out of bank credits. More importantly, Russia's credit markets in 1992-1994 may have shown a strange form of separating equilibrium. The privileged few received cheap credits from the CBR or pocket banks, without having to prove their creditworthiness. Others had to swallow high loan rates, which had some obvious adverse effects on loan quality. Modestly profitable investment projects were not financed and depended entirely on retained earnings, which hampered their growth. Hence, Russia may have combined a perverse form of credit rationing with the adverse incentive and adverse selection effects of high loan rates and high spreads, getting the worst of two worlds. In addition, Russian banks are plagued by systemic bad loan quality.

Loan rates and interest spreads were very high. The variation in loan rates is well explained by bank type and bank size. Amazingly state banks have higher loan rates. If there is any softness in state banks' loan policies, it is certainly not in low interest rates but rather in the availability of credit to borrowers that are not creditworthy. Interestingly, banks seem to set interest rates as a markup to costs and bank competition leads to higher instead of lower loan rates, presumably through the deposit rate effect of higher competition. The most fascinating finding is the fact that loan rates have adverse selection properties.

Building on these adverse selection properties of high loan rates and high spreads, we developed a model that jointly explains loan demand, loan quality and the liquidity level of banks. The crucial variable is the interest spread. Estimates show that the model accommodates the data reasonably well. The crucial factor in the model is the double-edged character of interest spreads. First, higher interest spreads will deliver lower demand for bank loans, due to a simple interest elasticity effect of loan demand. In addition, spreads also have an adverse selection effect, which means that average loan quality is negatively related to the interest spread. All our observations about bank loans and bank liquidity are very well explained by this model if we accept the hypothesis that banks are setting loan rates and hence interest spreads too high. The model gives an alternative empirical interpretation of the mechanism through which the Berglöf and Roland (1995) conjecture materialises. The key might be loan pricing and causation may in fact run in the opposite direction. Banks that underestimate the adverse selection properties of interest rates set interest rates too high. As a result loan quality is getting worse and excess reserves increase, without the latter being a direct reaction to the former. One of the side-results of the model is that we find clear indications of some remaining softness in the loan market.

So, apparently loan rates and interest spreads are set too high by commercial banks. What explains these high interest spreads? We found that some simple variables explain the spread reasonably well. Moscow-based banks have higher spreads and state banks lower spreads. What could be the underlying factors that explain spread differences? Since banks are setting loan rates as a markup to costs, high loan rates may be due to bank inefficiency. We analysed the efficiency by means of some simple bank ratios. We found that Moscow-based banks have

lower asset utilisation for all banks and higher capitalisation for small and medium banks. There are indications that interest margins are lower in Moscow, but income from other sources may be higher. With respect to state banks, the main conclusion is that they have lower interest margins than other banks. Asset utilisation seems to be higher, but this is not significant for all size classes. Also large state banks have smaller returns from other sources than other large banks. Apparently the state banks are more focussed on credit allocation than other banks. The analysis did not produce any clear interpretation of high spreads. On the contrary, state banks have high spreads while at the same time they seem to be more efficient in terms of higher asset utilisation.

However, inefficiency might lie in the small average scale of Russian banks. Scale effects might be large. Therefore we calculated cost functions for the Russian banking sector and derived estimates for scale effects from these functions. Strangely we did not find any scale effects in Russian banking. This is most probably due to the fact that large Russian banks were growing very fast and that Russian banks had not really engaged in intermediation yet. We did however find that state banks and non-state banks clearly had different cost functions and production technologies in the early stage of development.

Therefore we adopted another approach to understand Russia's high interest spreads. We developed a model that explains interest spreads as a function of several structural variables. These variables are the capitalisation, the required return on equity, the real deposit rate, the inflation rate, the average loan quality, excess reserves as a share of total assets (measuring excess liquidity and inefficiency of the payment system), centralised credit resources as a share of total assets (measuring dependence of commercial banks on CBR-credits), operational costs as a share of total assets (measuring efficiency), income from other sources as a share of total assets (measuring the dependence of banks on non-intermediation revenues), government bonds as a share of total assets (measuring crowding out effects or soft subsidies), the reserve requirement, and parameters measuring the hardness of the monetary policy with respect to the refinance rate, the financial repression inherent to required reservation and the soft subsidies to the banking sector through high yields on treasury bills. The nature of the model is simple. It rewrites a number of accounting identities and definitions as a function of the interest spread on the basis of the assumption that banks have to satisfy the restriction of a minimal real return on equity.

Notwithstanding its simple nature, the model delivered very interesting information both theoretically and empirically. Theoretically we can analyse the sign of partial derivatives of the spread with respect to one of these variables to find how a variable affects the spread. Often the sign depends on the relation between other variables of the model. We evaluated the sign of the partial derivative of some of the most important variables. One interesting theoretical finding was that, if systemic loan quality is bad enough and financial repression is soft enough (interest rates on required reserves are high enough) an increase in the reserve requirement might actually decrease the interest spread. Another finding was that exogenous shocks in loan quality could have a kind of multiplicator effect in Russia. A shock in loan quality may urge banks to set higher loan spreads. Since higher loan spreads have adverse selection effects, loan quality may decline further, which could induce even higher spreads and so forth. If banks do not understand the adverse selection effects of interest rates, and are unable to monitor projects adequately in order to ration credit and arrive at the efficient separating equilibrium,

an exogenous shock in loan quality might trap banks in a vicious circle of higher spreads and declining loan quality.

Empirically, we constructed appropriate estimates of the variables for Russia in 1994. Calculating the spread with these data yielded very high spreads, close to 100%. We simulated a number of scenarios, by changing one of the structural variables and solving for the spread. In this way we estimated the contribution of several parameters to the high spreads in Russia. This yielded some interesting insights. The most surprising finding was that the high dependence of banks on centralised credit resources contributed substantially to high interest spreads. The softness of the CBR was not in the interest rate, but in the availability of CBR-credit to banks that might never be able to pay back, which is equivalent to our finding on the softness of state banks. Not to our surprise, inflation was an important contributor to the high spreads. Apparently, the contribution of required reservation to the spread was largely due to the financial repression that follows from the fact that these reserves bear no interest. Also loan quality contributed strongly to high spreads. Note however that a number of factors in fact tempered interest spreads. Without them, spreads could have been even higher. These variables are high return on GKO, negative real interest rate, high income from other sources, low capitalisation and low required return on equity.

In addition we simulated a number of scenarios by changing not one but several structural parameters and solving for the spread. This allows us to form some expectations about future spreads. Would stabilisation solve the problem of high spreads? We defined stabilisation as follows : Zero inflation, no CBR-financing of commercial banks and relatively high positive real interest rates. This scenario delivers an interest spread of 3.2%, ceteris paribus. Interestingly, some factors that were not very important before, now come to the foreground. Required reserves and systemic loan quality contribute much more to the spread in the case of stabilisation. This seems promising.

A spread of 3.2% may however be an underestimation, since some of the factors that temper the spread may fade out together with stabilisation. For example, it seems likely that the easy profits of foreign currency speculation, real estate speculation, interbank credits, and payment fees would crumble along with stabilisation. Specifically, losing other income sources would strongly increase the spread. Rising capital requirements and rising return on equity requirements, that come along with stabilisation, reinforce this tendency. The last factor that may have contributed negatively to the spread is the growing emission of highly yielding GKO in recent years. The fact that foreigners have been excluded from these high GKO yields until 1997 is just another indication that GKO were to some extent a soft subsidy. However, this source of easy income is also set to decrease because of the growing involvement of foreigners in the GKO-market. Therefore, if Russia cannot solve the problem of the bad quality of loans and if it maintains its policy of financial repression, it may be facing spreads well above 10% in the near future.

The analysis thus shows that stabilisation will not by itself bring down the high interest spreads to an acceptable level. Unfortunately, high interest spreads are also one of the main causes of bad loans, because of adverse selection. Therefore, until the quality of the banks' monitoring capacities drastically increases, bad loans are likely to persist.

We have demonstrated sufficiently that the role of banks was fairly limited in the transition process. Banks were certainly not functioning as an efficient intermediary between savings of the population and credits, which should be their role. It is still possible that banks have played an important role in enterprise restructuring though, namely by restraining credit to non-creditworthy enterprises and working out the bad loans in their portfolio. In this way banks may have supplied some of the much needed corporate governance. The literature has considered the issue of which system of corporate governance would best fit Russia. We argue that, in the Russian environment, the market-based Anglo-Saxon system stands no chance. The choice is in effect between central bank finance, commercial bank finance and self finance. The analytical question is whether banks were engaging in corporate control or not, in early transition.

Unfortunately, this has been distinctively not the case. We already mentioned that the practice of CCR did not promote the monitoring skills of banks. In addition there are strong indications that the large bad loan portfolios have not urged banks to engage in enterprise restructuring or corporate control. On the contrary, banks seem to have been remarkably passive with regard to bad loans. In a theoretical model we explain this creditor inactivity. We develop a model that establishes the value of waiting and the optimal waiting period as a function of the time preference, systemic loan quality, debtor reputation effects and the cost of enforcement. We use the model to make some estimations of the value of waiting in Russia. It is clear that both the value of waiting and the optimal waiting period were high in Russia. This is mainly due to the low debtor reputation effects of non-payment and the high enforcement costs. One of the unexpected conclusions is that stabilisation will not by itself solve the problem of creditor inactivity. The main factor that determines the value of waiting in the case of stabilisation, is the cost of enforcement. As long as there exists no cheap and workable system to enforce loan redemption -say effective bankruptcy procedures-, banks will remain rather passive towards existing bad loans and may react by setting interest spreads too high and accumulating reserves instead of supplying new loans. Our earlier insight that stabilisation alone will not solve all problems is clearly supported by this.

We only considered the model in the case of one creditor and one debtor. In the more complex case of multiple creditors and multiple debtors, we showed that there may arise one out of two Nash-equilibria. There exists a bad equilibrium, where no bank enforces. Enforcement would be a signal of bad loan problems and be punished by savers (who withdraw) and debtors (adverse selection). There also exists a good equilibrium where everybody enforces. In this case, non-enforcement shows weakness and would be punished by debtors. Non-enforcement in one case would indeed stimulate other debtors to fail on their debts too, even if they could pay, since they expect they will not be punished by the bank, given the bank's reputation of non-enforcer. Russia might be trapped in the bad non-enforcement equilibrium. Let us assume that Russia would be able to introduce cheap and effective bankruptcy procedures on which banks could rely to enforce their claims. Even then, nothing might change, because banks might be stuck in the non-enforcement Nash-equilibrium. Given the behaviour of other banks, no bank can gain by deviating from the non-enforcement trap, not even if this might look interesting from a microeconomic point of view. The non-enforcement Nash-equilibrium functions as an additional barrier to enforcement.

The optimal policy to leave the bad Nash-equilibrium seems to be a combination of several measures. First, the government should commit itself to a credible once-and-for-all recapitalisation of large banks. This would reduce the adverse signalling effect of enforcement, introduce creditor reputation effects. Second, there must be strict regulation and supervision of banking activity. Strict bank supervision will ensure that the level of both risk-weighed capital and loan-loss provisions are adequate. Last, properly priced deposit insurance will soften adverse reactions of savers on enforcement by their bank and will stabilise the system. This combination can only be successful if there is a satisfactory system for enforcement at low cost. In the other case, the 'once-and-for-all bailout' will not be credible and the bad Nash-equilibrium will persist. This is precisely what happened in Russia. The 1992 inflation shock was in a way a massive bailout of banks. However, there was no decent deposit insurance and bank supervision was deficient. In addition there was no operational system for enforcement at low cost in place and building it might be a matter of decades. As a result, bad loans quickly reemerged and the bailouts were repeated by means of large swings of centralised credit resources and directed credits to banks.

Once more, a window of opportunity was spoiled. A once-and-for-all bailout would not be credible in Russia right now. Stabilisation will not solve the problem of inactivity and might ceteris paribus even aggravate it. Therefore the only remaining option for Russia might be to bite the bullet and continue the hard stabilisation-oriented monetary policy, together with the introduction of strict prudential bank control, properly priced deposit insurance and effective bankruptcy procedures. This creates a process of natural selection and will in the long run urge the surviving banks to start working out their bad loans, a process which has not reached a substantial speed yet.

Still, there was one mechanism through which banks were engaging in corporate control in early transition and which has become very important lately. This mechanism is the proliferation of direct ownership links between banks and enterprises. Banks increasingly became enterprise owners. Indeed, some banks have used their accumulated capital to invest in enterprise stock. Initially banks mainly founded their own enterprises, such as trading companies, brokers, real estate companies and so on. The voucher privatisation however gave banks a splendid opportunity to invest in industrial enterprises. Initially they could only acquire minority stakes, because privatisation was in reality a process of insider privatisation. Even if they only had minority stakes, banks were able to exert influence on enterprise decisions. After privatisation, banks have been investing money in enterprise stock in order to get enterprises under control. One of the most striking events in this field has been the development of financial-industrial groups. The legislation on financial-industrial groups (FIG) strongly restricted the role of banks in these FIG. Nevertheless bank capital diversified into industrial production on a large scale. Most banks and financial groups are at the centre of a FIG, be it an officially registered FIG or another FIG. This is the case for both small banks and large banks.

The 22 largest Moscow-based banks that operate nationwide have been able to get under control some key primary resources and industrial sectors of the Russian economy. They seem to be actively restructuring them, and do well in this respect. The government facilitated this process by its shares-for-loans programme and the cash privatisation auctions, which were only open to a few very big banks, favoured by the government. These banks have the power and

the ability to restructure these enterprises and to monitor and screen investment projects in a rational way. As a consequence these banks are not threatened any more by bad loans. The majority of small and medium-sized banks have also engaged in industrial activities, and seem on average still to be troubled by bad loans. So, the large banks are exerting corporate control, but mainly on the enterprises they control. Small and medium-sized banks do the same with smaller enterprises, but less efficiently. Enterprises that do not belong to a financial-industrial group of any kind, remain insider-controlled and have to restructure themselves. In the process they have to rely on retained earnings, because financial intermediation by commercial banks between savings and investments is still very deficient. In this way banks have failed to fulfil the role banks should fulfil in an efficient market economy.

Summarising we found that, notwithstanding the amazingly fast and strong development of the Russian banking sector, banks did fail to fulfil some of the basic functions of commercial banks in a developed market economy and had only a limited impact on the transition process. They turned out to be unable to collect savings of the population, were inefficient payment settlers and allocated loans in an inefficient way. In addition interest spreads were too high and banks' involvement in corporate control was at best limited. This was not due to the shock therapy of Russian transition, but rather to the lack of shock therapy. The large flow of centralised credit resources, the soft monetary policy of the CBR, the deficient bank supervision and control, the absence of effective bankruptcy procedures and of an explicit deposit insurance system all contributed to the failure of banks to fulfil their role.

A lot of historic opportunities were indeed missed. On the other hand the odds seem to have turned in 1994. Maybe Russia's approach will in the long run be not too bad after all. The chaos and the softness in our period of study was very destructive but enabled banks to accumulate capital. This may have had adverse consequences. A large number of rent-seekers grabbed the money and ran, which affected trust of savers. A few talented and ambitious banks however took the opportunity to grow very fast from zero to strong players in the Russian economy in only a few years time. A number of small and medium-sized banks are trying to follow their lead. We should remember that all banks are privately owned, with the exceptions of Sberbank and Vneshtorgbank that are owned by the CBR. The problem of their privatisation is not looming. And the government will not have to bail out the banking system in the near future, because the system is not in danger. This is amazing. Not many Western banks would manage to cope with the extremely unstable conditions of the Russian economy in the period under study.

The surviving banks seem to allocate credits mainly to the enterprises under their control. The larger banks seem to have already solved the problem of loan quality. The improvement of their loan quality is mainly due to corporate control exerted by means of banks' ownership links with these enterprises. As a consequence, credit is restricted to enterprises that are affiliated with banks. Other enterprises have to rely on retained earnings or swallow the still high interest spreads. The surviving banks are certainly capable and are learning very fast. And they have to, because the government has at many occasions shown its reluctance to intervene in case of financial troubles: In Russia, no commercial bank seems to be too big to fail.

Russian banks seem to be very small anyway. If we take total assets or capital as the criterion, even the largest Russian banks are small in an international perspective. However, if we take

into account the very young age of these banks, their growth rate and the territorial span of their operations, some Russian banks are surprisingly big. In this respect the prospects of the Russian banking sector are better than generally assumed. In the future we will see a continued process of further concentration of banking capital, which will lead to fewer and bigger banks with strong ownership links to the rest of the economy. The model of Russian capitalism promises to be peculiar. It certainly will be closer to the model of South-East Asia and Japan, than to the Anglo-Saxon market-based model or the European bank-based model, due to the very close links between finance and production. Nevertheless the wide-spread insider control makes it a system of its own kind. But this is subject to further research.

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