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COMPETITION AND MARKET DYNAMICS ON THE RUSSIAN DEPOSITS MARKET

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Abstract	In the early transition era in Russia entry barriers for commercial banks were about absent. It resulted in the mushrooming of hundreds of small, poorly-endowed and inexperienced banks. In this paper we address the question whether the claimed benefits of low entry barriers - competition and market dynamics – have resulted. We use a sample of commercial saving banks for the 1994-97 period. We conclude that there were important mobility barriers and that the removal of entry barriers did not lead to intensified competition.	
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Competition and Market Dynamics on the Russian Deposits Market

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Abstract

In the early transition era in Russia entry barriers for commercial banks were about absent. It resulted in the mushrooming of hundreds of small, poorly-endowed and inexperienced banks. In this paper we address the question whether the claimed benefits of low entry barriers – competition and market dynamics – have resulted. We use a sample of commercial saving banks for the 1994-97 period. We conclude that there were important mobility barriers and that the removal of entry barriers did not lead to intensified competition.

Keywords: Banking; Market shares; Transition economies

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1. Introduction

Economic development and structural transformation of the transition economies are dependent upon the extent to which banks function as financial intermediaries, permitting an efficient separation between savers and investors. The development of commercial banking in Russia after the 1988 banking reform has been enormous in terms of numbers. In 1995 there were already around 2500 banks registered (Buchs (1999), Warner (1998)). The benefits of free competition among banks on the savings market in transition economies, a supposed consequence of a liberal entry policy, are by no means clear. In recent articles there is a tendency to prefer competition above concentrated and sheltered banking systems (see e.g. Smith (1998)). Claesens (1998) claims that more liberal entry can bolster the development of banking systems in transition economies. Gorton and Winton (1998), being aware of the delicate trade-off between stability and efficiency, argue that some banking instability may be inevitable to achieve an efficient commercial banking system. However, there are several reasons to fear that a walk over the 'new entry'-path may be a dangerous journey.

The development of Russia's banking sector was regarded as a success until the 1995 liquidity crisis and the 1998 Rouble crisis showed some important instabilities in the financial system. An important structural reason for these instabilities is that even when the Russian banking sector was considered unusually successful, no less than four out of five banks conducted business with dangerously low funding capital, not hindered by enforcement of reserve requirements (Buchs (1999), section 4.2). Massive entry implies that many banks are small and not experienced, the asset portefolio is one-sided, management may be incompetent or it has bad intentions. Many reasons to expect that the probability of bank failures will increase. Estrin and Wright (1999) show that Russia is performing relatively poor when it comes to progress in the transition of the financial institutions. They argue that there is no effective bank supervision and little or no lending by financial institutions to the private sector. In recent literature that stresses the benefits of competition in the banking sector, the problem of bank failures is sometimes mentioned, but it is implicitly or explicitly assumed that it is a short run phenomenon, and that the social costs are insignificant compared with the virtues of competiton and private ownership.

In the present paper we argue that a liberal entry policy during a period of economic turmoil provides little benefits in terms of efficiency while contributing to instability. The large majority of new and small banks fail to achieve a sound market position as they suffer from a liability of newness: "the new banks will be very risky and prone to failure, not only because of the risk of their loans, but because private agents such as depositors and established banks will demand premia if they are to invest in these new banks" (Gorton and Winton, 1998, p.647).

Our analysis shows that the extent of competition on the deposits market was low despite the high number of market particpants because new banks face important mobility barriers and have been no important threat to the large incumbent banks (which were also favoured by the government). We concentrate on the Moscovian segment of the Russian three months deposits market during 1994 - 1997. Specifically, we investigate the determinants of the market shares of the incumbent banks, the impact of the interbank crisis in August 1995, the determinants of the choice of their strategies and the extent of competition on this market as measured using a model originally developed by Barros and Modesto (1999).

Economic transition from plan (socialist accumulation) to market (capitalist growth) requires a well-developed banking sector and an adequate household savings market. There was little need for households to save in the central planned economy (EBRD (1996)). Employment was virtually guaranteed, the state provided social security benefits that eliminated the need to save for a 'rainy day' or for retirement. Additionally, there was little access to durable products. Therefore, households are to be expected to save a higher share of their disposable income in market (capitalist) economic systems than in the former Soviet system. Table 1 shows the share of savings in total disposable income.[1] During the period 1993-1997 this share was about one quarter. In 1998 there was the ‘Rouble crisis’ and the saving rate dropped quite strongly. The share of deposits and securities in total household savings has been steadily decreasing since 1993. Households could put their savings in three categories: deposits and securities, hard currency in banks and cash money. The decline in the share of deposits and securities in the total household savings has been due to a strong increase in the share of hard currency in banks. That is, we establish that only a small and diminishing part of household savings has become available for funding business investments or government expenditures.[2] The majority of savings is kept in cash (Roubles) or hard currencies.

In our study of the performance and dynamics of the Russian deposits market, we will use a (quarterly) data set acquired by the ACE-project group 'Role of information on Russian individuals' savings market' (Avdasheva, 1998). The data describe the period of the first quarter of 1994 till the second quarter of 1997. Many banks entered and also many left the savings market during that period. In the beginning of the period under investigation inflation was extremely high, because the Russian government was creating money to resolve budget deficits. The main task of the banking sector in this time was the transfer of the so-called

[1] Gregory et al. (1999) doubt whether the household savings have been as high as reported in the official statistics which have been used for the table. Using survey data they argue that the total household savings rate has been much lower. Because they find that the official data for the deposits and securities category are much more in line with the survey results, the share of deposits and securities in the total household savings rate is thought to be much higher.

'centralized credit' from the government to state enterprises and other public institutions. In August 1995 the Russian interbank loans market collapsed in a web of non-payments. In reaction to the financial crisis the government tightened its monetary policy successfully. The raging inflation process stopped and consequently the profit opportunities of the commercial banks disappeared, because the stream of centralized credit dried out and the banks could no longer earn inflation rents (Schleifer and Treisman (1998), p.44). The role of the banks changed drastically; in stead of transferring subsidies, they had to finance the necessary expenditures by the Russian government. For this reason the household savings market became an important financial source, not so much for private investment, but for state expenditures. The banks were inclined to attract household savings, because the government offered them relative high interest rates for short-term state securities on the GKO-market. The average profitability of banks, which was huge, went down as a result of the change in government policy, but still remained high (Warner (1998)). In this context a small group of banks was privileged, because only they were allowed to enter the primary GKO-market. Also the position of Sberbank (State Savingsbank) was strengthenend: it became the official dealer in GKOs for the Central Bank of Russia, and also the Ministry of Finance payment agent for coupon dividends and bond redemption.

The rest of this paper is organised as follows. In Section 2 we discuss the multinomial logit market share model which we use to determine the extent of market dynamics. Section 3 is used for a description of the data set and for a discussion of the results of a survey on saving behaviour. In Section 4 we present the empirical results for the market share model. This is followed in Section 5 by an investigation into the strategies used by the saving banks during the 1994-1997 period. In Section 6 we develop and estimate the Barros and Modesto model to measure the extent of competition on the Moscovian deposits market. Section 7 concludes.

2. The multinomial logit market share model

Market shares of firms have two basic properties: they are positive and they add up to unity. A well-known model satisfying these conditions is the multinomial logit market share model. The model can be derived as follows. Consumers choose between n competing products (banks). The products differ in their attractiveness to them. The utilities of holding deposits at each of the n banks are assumed to be random variables which have a joint multivariate

[2] Warner (1998) reports that Russian banks had a very small share of interest-bearing deposits when compared to U.S. banks. For a sample of Moscow banks the average percentage of those depostis was a mere 2% of assets compared to 49% on average for the U.S. commercial banks.

extreme-value distribution.[3] This assumption allows to derive a simple relation between the probability of choosing a certain bank and the values of attraction of the *n* banks in the Moscow deposits market.

Denote by U_i the random utility of holding deposits at bank *i*. The probability that saving bank *i* is chosen is then equal to $P[U_i \geq U_j \quad j = 1,...,n]$. We assume that $(U_1,...,U_n)$ has a *n*-variate extreme value distribution of the form:

(1) $$F(u_1,...,u_n) = \prod_{i=1}^{n} \exp(-\exp(a_i - u_i))$$

where $a_i = \ln(A_i)$. It can then be shown that the probability of U_i being the largest among the utilities equals (see e.g. Cooper and Nakanishi (1988, p.50-51)):

(2) $$P[U_i \geq U_j \quad j = 1,...,n] = \frac{exp(a_i)}{\sum_{j=1}^{n} exp(a_j)} = \frac{A_i}{\sum_{j=1}^{n} A_j}$$

We do not observe individual choices but we have available the aggregate outcome of all the individual choices: the market shares. If we denote by A_{it} the value of 'attraction' of product *i* in period *t*, then the market share of product *i* is assumed to equal:

(3) $$s_{it} = \frac{A_{it}}{\sum_{j=1}^{n} A_{jt}}$$

The value of 'attraction' is assumed to be determined by *K* predetermined variables, x_{kit}, as follows:

(4) $$A_{it} = \exp(a + \sum_{k=1}^{K} b_k x_{kit} + e_{it})$$

One may derive from equations (3) and (4) that the effect of the predetermined variables on the market shares equals:

[3] Fishburn (1998) argues that "The most common locus of randomness for stochastic utility may be preference comparisons between complex objects that are difficult to compare because of multiple attributes, environmental uncertainties, and incomplete specification." (p.276).

(5) $\frac{\partial s_{it}}{\partial x_{kit}} = b_k s_{it}(1 - s_{it})$

Cooper and Nakanishi (1988) show that the effects of the predetermined variables on attractiveness can be estimated from the following model:

(6) $\log(s_{it}) = \sum_{u=1}^{T} g_u d_u + \sum_{k=1}^{K} b_k x_{kit} + e_{it}$

where d_u are time dummies for each of the periods 1 through *T* and e_{it} is an error term. Consistent estimates of the parameters in equation (6) can be achieved by applying ordinary least squares. The predetermined variables in our multinomial logit market share model are of three kinds. The first are variables that differ across products but are constant over time. The second are lagged values of variables that are actively chosen by firms, such as advertising and the price level. The third is $log(s_{i,t-1})$, the lagged value of the endogenous variable. This variable is included to correct for and to measure consumer loyalty.

3. Data and results of a survey of saving behaviour

We have data available of each Moscow-based bank 'active' on the three months deposits market. The bank was defined to be 'active' when (i) it had got a licence from the Russian central bank to offer saving accounts for three months deposits and when (ii) it had advertised at least once in a Moscow newpaper. For the period 1994-1997 about 70% of the expenses for sales promotion was allocated to advertising in newspapers. We have quarterly data available from the first quarter of 1994 to the second quarter of 1997. In the empirical analysis we incorporate only those banks that reported the amount of personal deposits. The entry date is taken to be the first time that the bank reported deposits (and had advertised). It is equal to or later than the licency date.

The variables in the data set consist of (i) quarterly interest rates, personal deposits, licency dates and sizes of total assets of the official banks, derived from *Finansovije Izvestia* and *Commersant rating,* based on information of the Central Bank of Russia; (ii) advertising outlays of Moscovian banks collected by the consulting agency NEX-SV in Moscow.

A summary of the market share data for the Moscovian three months deposits market is given in Table 2. Over the period 1994.I (the first quarter of 1994) to 1997.II (the second quarter of 1997) we see a rise in the number of saving banks, reporting deposits data, up to

56 followed by a decline to 30. The majority of the banks is small, but at the end of the observation period eight saving banks had market shares above 5%. The maximum market share has been below 20% for most of the quarters. A clear exception is the first quarter (1994.I) during which the Sber-bank still had a share of about one third of the three months deposits market. The Herfindahl Index is also at its maximum in period 1994.I and equals 0.153. This concentration index decreased up to 0.049 in quarter 1995.II and rose again steadily after the August 1995 crisis to 0.080 in quarter 1997.II.[4] In the last two columns of Table 2 we show the number of firms, and their average market shares, for which the data necessary for the multinomial logit estimation procedure are available. The percentage of firms for which these data are available has increased over time.

During the period of investigation the deposits interest rate has, on average, declined. In Table 3 the average, minimum and maximum interest rates offered by the banks are given for the period which we use in our analysis. Since mid 1995 up till mid 1997 the average interest rate has declined quite strongly. The standard deviation of the interest rates has declined as well, with the standard deviation in 1997.II being only one fifth of that in 1995.II. Therefore, the absolute difference between the interest rates of the market participants has diminished. The relative difference has remained quite constant, though. Table 3 shows that the coefficient of variation had a maximum of 0.15 in early 1996 and a minimum of 0.09 both in late 1995 and in 1997.II. The ratio of the maximum to the minimum interest rate was between 1.5 and 2.0 in each of the quarters. In the last column of Table 3 the correlation between the interest rate offered and the market share of the bank is given. In the period 1994.III till 1996.I there was a clear negative correlation: banks with small market shares offered relatively high interest rates. Since 1996.II the interest rate and market share have been largely uncorrelated. This indicates that either (i) small banks offering relatively high rates have exited or that (ii) small banks have become more cautious in using a risky high interest strategy or that (iii) large banks have been more eager to use the savings market as financial source and started to offer higher rates.

Some important decision criteria for Russian households to choose a bank are closely related to its size. 'Large' banks usually have a lower probability of bankruptcy,[5] offer a wider package of services and have a larger network of local offices. A common measure of the total size of a bank is the total amount of assets. We have available information on the total amount of assets for most banks and for these banks for most of the quarters. However, the

[4] Russia has a relatively low concentration of bank market power when compared to other transition economies. See for example Table 2 in Gorton and Winton (1998, p.627).

[5] In Table 37 of the Statistical Addendum to the 1997 annual report of the Bank of Russia, banks were ranked according to their financial condition on May, 1st 1997. Out of 2,594 banks there were 706 (27%) whose licence was revoked. Their total assets amounted to 8% of the total assets in banks. Additionally, there were 540 banks (21%) which were in critical financial condition. Their total assets equaled 5% of the total assets in banks. These figures show that mostly small banks encountered financial problems (at least before the 1998 Rouble crisis).

assets variable poses some difficulties of interpretation. First, it is often unclear what assets are incorporated and what assets are not. Second, there is an important problem of asset valuation. There have been high default rates on loans. In fact, some banks starting to default on repayment of their loans started off the August 1995 crisis. Third, for some banks data on assets are not available for all quarters. However, from data available for other quarters we can deduct that they are relatively large or small.

We decided to divide the saving banks into two categories: one of banks with a relatively large amount of total assets and one with banks with a relatively small amount of total assets. It should be noted that the three months deposits market consitutes only a small part of the total assets of the banks. For example, the Sberbank was by far the largest bank in terms of assets while its market share in the Moscow three months deposits market was relatively small. In Table 4 we show the 11 saving banks which had total assets in the top 8 in at least 3 out of the 14 quarters. These banks are in the category of 'large' banks and none exited during the period under investigation. Most of them had relatively high shares in the deposits market with the exception of the Imperial Bank. In 1997.II the total share of the 11 TOP8 saving banks was equal to 77%.[6]

Early 1998 the Centre of Public Opinion Investigation (a professional survey agency, in Russia known as VCIOM) performed a survey in Moscow for the ACE-project 'Role of information on Russian individuals' savings market'. The total number of respondents was 1424 with 865 of them (61%) in fact having any savings. From the respondents with savings, 53% had their savings in cash money, 43% had their savings in the Sberbank and 18% had their savings in other banks (note that these figures do not add to 100% as respondents may have chosen more than one category).[7] The respondents were asked to rate the importance of seven criteria of bank attractiveness on a scale from 0 (not important) to 5 (very important). The average scores of respondents with savings for the seven criteria can be found in Table 5.

Two criteria in the survey were considered to be of high importance to the respondents. The reputation of the bank was mentioned as the most important criterion of attractiveness, on average, followed by the interest rate offered by the bank. Advertising was considered as relatively unimportant, but this does not necessarily imply that choice is barely affected by advertsing. It is not unusual for respondents to underestimate the impact of advertising on

[6] The dependence of a bank on the Moscovian three months deposits market – in terms of the ratio of deposits over total assets – is at its maximum for the two smallest (in terms of assets) banks in 1997.II. These two banks are the Optimum-Bank (ratio is 23.3%) and the LEFKO-Bank (ratio is 20.8%). The bank with the highest market share (Incombank) had a ratio of 6.6%.

[7] Note that the 1998 survey sample appears to have disproportionaly many people with savings in the Sberbank when compared to the market share of this bank in the three-months deposits market (1994-1997). This is for some part caused by the people with high savings amounts (people with high income level, like entrepreneurs and managers) who have a relatively high propensity to have savings in other banks but make up only a small percentage of the sample.

their consumer decisions. Respondents with their savings (only) in private banks rank 'scope of services' and 'annual balance sheet' as important criteria. The latter suggests that many Russians did not behave naïvely when depositing their savings in a commercial bank. The last column of the table shows that clients of private banks tend to attach a higher value – on average - on the criteria of attractiveness. This suggests that clients of private banks are more conciously seeking for the most adequate bank given their preferences.

The questionnaire provides useful information about the public perception of factors of attractiveness of saving banks but it leaves at least one important question unanswered. This question is how the decision to choose a bank is determined on the basis of the factors of attractiveness. For example, if a respondent has highly valued both “Reputation” and “Interest Rate”, does this then mean that he or she is indifferent between a firm with high reputation but low interest rates, a firm with medium reputation and medium interest rates and a firm with low reputation but high interest rates? This is the case when the decision to choose a bank is determined by a linear function of the various criteria. However, it may also be the case that the respondent prefers that bank offering the highest interest rate among a group of banks with high reputation. That is, the high average valuation of “Reputation” could imply that banks with low reputation are removed by many people from their choice set. In the next section we find empirical evidence for this interpretation.

4. Empirical results for the market share equation

Regression results for equation (6) are presented in Table 6. The determinants of market share that we consider are the interest rate offered (INT), the assets size of the bank (the dummy variable TOP8), the advertsing expenses (A) in the previous quarter(s) and the market share in the previous period. In total there are 469 observations available. For these observations the mean and standard deviation of market share are 0.024 and 0.033, respectively. The dependent variable in equation (6) is the logarithm of market share (LNSHARE).[8] The mean and standard deviation of this variable are –4.560 and 1.346, respectively. The mean of the interest rate variable, INT, equals 0.727 with a standard deviation of 0.241. The mean and standard deviation of the lagged advertising dollar amount, A(-1), are 72.6 and 103.8, respectively. We did not find any effect of the licency date and did not include it in this analysis.

We have also considered whether the effects were different before and after the August 1995 crisis. We found strong evidence for the lagged market share variable to have a very different

[8] Whereas the market share data are highly non-normally distributed, the hypothesis of normality of the logarithm of market shares cannot be rejected. The Jarque-Bera $\Pi^2(2)$-test on normality is 1323.27 (p-value 0.000) for the market shares case and 4.45 (p-value 0.108) for the logarithm of market shares case.

effect before and after the crisis, but failed to find evidence for that for any of the other variables. We have chosen each of the predetermined variable in a logarithmic form as well.

The results can be summarized as follows. Interest rate has no influence on market share except when the bank has a high amount of assets (the cross effect LN(1+INT)*TOP8 is significant). Savers seem not to be attracted to banks which offer high rates but are small and, hence, risky. Among the 'large' banks, interest rate is an important criterion used by Moscovian savers to choose a bank. Advertising in the previous quarter(s) has a significant effect on market share. That is, despite the results of the questionnaire in which Moscovian savers rank advertising low on the list of criteria of attractiveness, advertising appears to affect them in their choice behavior. We return to the specific lag structure of the effect of advertising after the next paragraph.

The results indicate that before the 1995 crisis a bank could count on 85% - on average - of the deposits market share of the previous quarter to be attracted irrespective of interest rates and advertising. After the crisis this percentage increases up to 94%. Therefore, the extent of market dynamics has decreased after the crisis. Small and young firms appeared to have been able to gain market share relatively easy before the crisis. After the crisis this was much more difficult and a considerable consolidation in the banking sector took place.

In order to evaluate the lag structure of the effect of advertising we present the effects of advertising lagged from 0 to 4 quarters. The results are presented in Table 7. Current advertising does not have a significant (immediate) effect on the market share. This is a consequence of deposits being measured at the beginning of the period while the amount of advertising is spent during the entire period. Advertising lagged one and two quarters both have a (similar) significant effect. According to the table the advertising effect has faded out in the third quarter as there appears to be no effect of advertising lagged three or more quarters. This confirms our choice for the lag structure in Table 6.

Observations can only be taken into consideration in the regression analysis of the first column of Table 6 if they have a positive market share both in the current and in the previous quarter. This requirement implies that entrants in the current quarter are omitted from the analysis because they do not have a positive market share in the previous quarter. Firms which were in the sample in the previous quarter but which have exited in the current quarter are also omitted as they do not a positive current market share. The omission of the entering and exiting firms is likely to bias the results. In particular, we expect that market share dynamics will be underestimated when these firms are not included. To test for this we assumed that an entering firm had a market share in the previous quarter of 0.001 and that an firm which exits in the current quarter also gets a market share of 0.001. Only 5% of the observed market shares in our sample (24 out of 469) have a market share which is less

than 0.001. Therefore, we assign entrants to have been quite small before they entered and we assign exiting firms to become quite small.

In the last three columns of Table 6 we present the results of the effects of including entrants and exiting firms on market share dynamics. The effect of interest and advertising are not accounted for as data are not available for firms that exit (interest rate) or enter (lagged advertising). In total there are 45 extra observations concerning exits and 27 extra observations concerning entrants.[9] When entrants and exiting banks are included we find that consumer loyalty becomes much lower in the period before the crisis but that it is only slightly lower in the postcrisis period. Therefore, the finding that market share dynamics have decreased after the August 1995 crisis is affirmed by also considering entry and exit. The last two columns of Table 6 also show the results when next to incumbent firms only exiting firms or only entrants are incorporated. The effects are for both cases in between that for the base case with no entry and exit and the case of both entry and exit included.

5. Saving bank strategies

Considering the two marketing instruments of interest rate offered and marketing expenses one may divide the saving bank strategies into four categories. The first strategy is a strategy of offering high interest rates and having high marketing expenditures. This strategy may be especially attractive for entrants with adequate financial resources like 'large' banks which had not yet diversified into the three months deposits savings market. Because of the small market shares they do not suffer much from lower margins. The second strategy is a combination of offering low interest rates and having high marketing expenditures. Incumbents with high market shares and adequate financial resources may opt for this strategy. They maintain their market shares by advertising a lot while they do not suffer a decrease of the margins on their deposits. The third strategy consists of offering high interest rates and spending relatively low amounts on advertising. This strategy may the only viable option for small and entering saving banks with no adequate financial resources. Their lack of financial resources does not allow them to invest much (in advertising) before they start to make profits. The final strategy is one of inaction. Banks which offer low interest rates and spend low amounts on advertising appear to (temporarily) have no intention to improve their market position. In Figure 1 we show a tree diagram of the choices saving banks make with regard to their possible strategies.

[9] Three of the exits take place in 1994.III so this would imply that the total net exit over the 1994.III-1997.II period is 42 minus 27 is 25. This figure is one more than the difference between the number of banks in 1994.III (54) and that in 1997.II (30) found in Table 1. It has to do with data requirements on including incumbent banks in the analysis.

[Figure 1 about here]

In Table 8 our sample of saving banks in the 1994-1997 period for which interest rates and advertising expenses are available, is split into the four categories of strategy. The two criteria for splitting the sample of 570 observations of banks are defined as follows: 'High interest rate' implies that the interest rate is above average for that quarter, while 'Low interest rate' implies that it is below average. 'High advertising' implies that advertising expenses are above the median advertising expenses for the total period (which is 33), while 'Low advertising' implies that they are below this median.

The average probability of a bank being a TOP8 bank is 22.8% for the entire sample and the average licency date is 92.5 (the third quarter of 1992). The table shows that young organizations with little financial resources dominate the strategy characterized by offering high interest rates and having low advertising expenses. Our market share analysis has shown that this strategy has not been very successful. The category of banks with low interest rates and high advertising expenditures contains relatively old and large firms. One measure of the success of the different strategies is to consider what strategies the exiting banks have been using in the period before. In Table 9 we summarize the proportions of exits classified to the last (observed) strategy they used. No less than 60% of all exits used the High Interest Rate, Low Advertising Strategy. The results do not imply that banks choosing this strategy made the wrong choice *per se*, as they often were not left another choice than using it.

6. Was there competition on the Moscovian deposits market?

Our analysis has shown that there have been important barriers to mobility on the deposits market. We now turn to the question of the extent of competition on the Moscovian three months deposits market. For this we apply the recently developed oligopoly model by Barros and Modesto (1999). In this model banks compete on interest rates for deposits. Barros and Modesto assume a Dixit-type utility function for the representative consumer.[10] This corresponds to the consumer's utility U being a function of deposits held at the n banks ($d_1,\ldots,d_n$) and the income spent on outside goods Y. The level of the income spent on outside goods is equal to the sum of exogenous income y and interest received:

(7) $$Y = y + \sum_{i=1}^{n} r_i d_i$$

[10] Given the Portuguese situation Barros and Modesto investigate the public bank as a vehicle for the government to regulate the market. This is not a relevant issue for the Russian savings market.

where r_i is the interest rate offered by bank *i*. The consumer's utility is assumed equal to:

$$(8)\quad U(d_1,...,d_n,y)=\sum_{i=1}^{n} a_i d_i - \frac{1}{2}\left(b\sum_{i=1}^{n} d_i^2 + 2g\sum_{j\neq i}^{n} d_i d_j \right) + Y \qquad a_i, b, g > 0 \quad g < b$$

The bank specific parameter $''_i$ stands for the attractiveness of holding deposits at the specific bank *i*. This attractiveness may be a function of credibility, the number of branches, etc. The ratio $0 \le g / b < 1$ is a measure of substitutability between each bank and all of the competing banks. In case g equals zero there is no substitutability and the demand for holding deposits at a bank does not depend upon the attractiveness and the interest rate of any of the other *n*-1 banks.

The amount of deposits held by a utility maximizing consumer at each of the *n* banks equals:

$$(9)\quad d_i = \frac{\{b+(n-2)g\}(r_i + a_i) - g\sum_{j\neq i}^{n}(r_j + a_j)}{(b-g)\{b+(n-1)g\}} \qquad i = 1,...,n$$

Banks are assumed to compete on interest rates for deposits. They consider their (future) attractiveness $''_i$ to consumers not to be affected by these rates. This does of course not preclude the (future) attractiveness of a bank being affected by strategic choices on other variables, like advertising. Banks maximize their profits B_i on their deposits accounts:

$$(10)\quad p_i = (R_i - r_i)d_i - F_i \qquad i = 1,...,n$$

where R_i is the rate of return of investments pursued with the deposits confided by consumers to the bank. This return may be different for banks depending for example upon their access to the GKO market. The first order condition of profit maximization gives the following best reply functions:

$$(11)\quad r_i = \frac{1}{2}(R_i - a_i) + \frac{g}{2\{b+(n-1)g\}}\sum_{j\neq i}^{n}(r_j + a_j) \qquad i = 1,...,n$$

If we sum across all banks we find that:

$$(12)\quad \sum r_i = \frac{[b+(n-1)g]\sum R_i - b\sum a_i}{2b+(n-1)g} \qquad i=1,\ldots,n$$

From equation (12) it is easy to derive that we expect the average deposit interest rate to be less than *half* the average rate of return on investment in case there is no substitutability ($g=0$). In case of perfect substitutability ($g/b=1$) and a high number of market participants *n*, we expect the average deposit rate to be close to the average rate of return on investment. A first test of the extent of competition, therefore, is to compare the average rate of return on investment and the average deposit interest rate.

By introducing $q(n)=\frac{1}{2}g/\{b+(n-2)g\}$ equation (11) may be rewritten as:

$$(13)\quad r_i = q(n)\sum_{j=1}^{n} a_j + \frac{1}{2}R_i - \left(q(n)+\frac{1}{2}\right)a_i + q(n)\sum_{j\neq i}^{n} r_j$$

That is, the interest offered by bank *i* depends upon four factors: the number of banks *n*, the rate of return R_i, their own attractiveness $''_i$ and the interest rates of the competitors. An important issue in the application of the oligopoly model is to determine which banks are in the market. We consider banks 'active' on the market in case (i) they had a positive market share in the previous quarter; (ii) they reported deposit and interest rate data; (iii) they had advertised at least once in a Moscow newspaper. The number is presented in the fourth column of Table 11.

In Section 3 we discussed several reasons apart from the interest rates offered why some banks may be more attractive to consumers than others. Banks may derive their attractiveness from having a large network of branches, from having a wide assortment of banking activities, from having a good image or from being perceived as credible. Credibility was a key factor for Russian consumers deciding where to hold their deposits. The probability of banks going bankrupt during the mid 1990s was very high when compared to their counterparts in the highly developed capitalist economies. Bankruptcy was not confined to banks with small market shares on the deposits market. Major players like National Credit and Tveruniversalbank, for example, lost their licencies in 1996.

We distinguish four variables determining the attractiveness of Russian deposits banks: (i) the total amount of assets (using the TOP8-dummy); (ii) the date of licensing (using the licency class variable LIC)[11]; (iii) the share of the deposits market and (iv) the amount of

[11] The licency class (value of LIC) is 1 in case the licency date was before the year 1992. A firm is classified to be in licency class 2, 3 and 4 when the licency dates were in the years 1992, 1993 or 1994 and later.

advertising (using ln(1+A(-1)))[12]. The first two variables are very much related to the factor of credibility. Generally old banks with high amounts of assets are less likely expected to go bankrupt. The third variable is related to various factors like the extent of network of branches and the degree of familiarity to consumers. The fourth variable of advertising is a strategic variable. When banks advertise a lot, they gain attention of consumers and become part of the choice set. Advertising might also enhance credibility. Sales promotion is essentially a sunk cost. Apparently the bank has the intention to settle down and may give information assuring the public that the organization is solid. The household therefore may not expect that a bank actively engaged in advertising wil run in financial troubles. However, it is doubtful whether this expectancy was confirmed during the mid 1990s in Russia.

As a measure of the rate of return R_i we take the GKO yield on the secondary market. GKOs are federal treasury bills with a 3 to 6 months maturity, issued by the Ministry of Finance of the Russian Federation. The GKO market became increasingly important during the years 1995 and 1996.[13] In Table 10 we show the average deposit interest rates and the GKO yield (in the previous quarter). Up till the 1995 liquidity crisis the yield was high and unstable. After the successful tightening of the monetary policy the yield delined strongly. In addition to the GKO yield the percentage change of the consumer price index (CPI) and the percentage change in the exchange rate versus the US dollar (EXR) are given in Table 10.

From Table 10 it is clear that the GKO yield on the secondary market has always been higher than the average deposit interest rate. In five out of 13 quarters the GKO yield was even more than *twice* as high as the average deposit interest rate.[14] These quarters are also the quarters with the highest GKO yields in the period under investigation. Some preliminary conclusions from the table are that (i) the extent of competition seems to have been low and not constant over time and (ii) the extent of competition is negatively related to economic stability (in terms of GKO-yield, inflation and exchange rates).

The attractiveness of a saving bank is determined by the four factors discussed. If we denote the *j*th factor for bank *i* in period *t* by x_{ijt} we have that $a_{it} = \sum_{j=1}^{4} w_j x_{ijt}$. The equation to be estimated is:

$$(14)\quad r_{it} - \frac{1}{2}R_t = q_t \sum_j w_j \sum_{k \neq i} x_{kjt} - \frac{1}{2}\sum_j w_j x_{ijt} + q_t \sum_{k \neq i} r_{kt} + e_{it}$$

[12] We did not include advertsing two quarters lagged, A(-2), in the logarithmic expression to benefit from an additional quarter of information on the extent of competition. Results with A(-2) included are hardly different from the ones presented in Tables 11 and 12.

[13] The total GKO and OFZ nominal outstanding in billion Roubels in January of the years 1994 through 1998 was 285; 15,314; 79,997; 248,449; and 390,890, respectively (source: Russian Economic Trends (RET) of the Stockholm Institute of Transition Economics and East European Economies (SITE)).

[14] Warner (1998, Table 5) reports even higher spreads between lending rates and deposit rates. He concludes that the declining level of inflation is the explanation for the decline in bank profits.

Given the estimate of q_t the implied value of g_t / b_t equals $\hat{q}_t / [0.5 - \hat{q}_t (n_t - 2)]$.

The estimation results of equation (14) are given in two tables. In Table 11 we present the estimated of q_t and the implied value of g_t / b_t. In Table 12 we present the estimates of w_j, i.e. the effects of the determinants of the attractiveness of a saving bank. Table 11 shows that the estimates of q_t are far from constant over time. In quite some cases the estimate is even negative. Only at the beginning and at the end of the sample period the estimates are relatively constant over time. Barros and Modesto (1999)'s results give that g / b was 0.17 for the Portuguese banking sector (the number of commercial banks equalling seventeen). On average the extent of competition in Moscow was estimated to be lower although in the first two quarters of 1997 it is of a comparable magnitude. That is, in a period of increased stability the extent of competition in Moscovian and Portuguese banking may not be that different. In periods of large instability as in 1995 in Russia the extent of competition appears to be hard to measure using standard theories as developed by Barros and Modesto.

There are several reasons to expect that the extent of competition depends upon the degree to which the market is transparant and stable. We expect that there is less price compettion in a market which is not transparant and/or which is unstable. During the period 1994-1997 the Russian capital markets went through periods of high and low uncertainty, inflation and interest rates. Useful indicators of the extent of instability and uncertainty are the GKO-yield, change in the consumer price index and in the exchange rate.[15] The correlation coefficient between the implied g_t / b_t and the GKO-yield is –0.70. For the change in the price index (CPI) it is –0.35 and for the change in the exchange rate (EXR) it is –0.57.

The results can be summarized as follows. The measured intensity of competition is less than the competitive strength Barros and Modesto reported for the Portuguese savings market. We find evidence of the extent of price competition to vary with the economic tide. During periods of economic turmoil – either through quickly changing prices or exchange rates – competition seems to be much lower than during periods of relative stability. The empirical evidence for economic stability to be a precondition for a competitive saving market has important consequences. It indicates that the emergence of a competitive banking system may only occur after stable economic relations have been assured. Or, a fast process of privatization of the banking sector and an introduction of competition by keeping

[15] The interpretation of this result of our analysis is connected with the question why the GKO-yield was fluctuating. If it reflects the economic tide, in which periods of economic turmoil are alternated by relatively stable ones, then it is clear enough that economic stability is a precondition for competition. However we have to keep in mind, that the primary GKO-market was (and is) a monopsony. The changes in the GKO-yield may be an indication of the market power of the state.

entry barriers low may not be the adequate first steps in the transformation process from a communist to a capitalist economic system.

7. Conclusion

There have been two distinct approaches to the reform of the financial institutions in transition economies, characterized by Claessens (1998) as 'rehabilitation' and ‘new entry’. In countries in which the first approach is chosen, for instance in Poland, a high share of household deposits still remains in the state savings banks during transition. In the Russian Federation a different approach was chosen: the 'new entry'-path. The break-up of the Soviet-Union and the split up and privitization of the Gosbank created an environment in which many de-novo banks could be founded. The Ministry of Finance and the Central Bank of Russia did not interfere in the more or less spontaneous privatization process and did not create barriers to entry, because they aimed to achieve a competitive banking sector as quickly as possible.

The main problem with the many small banks entering the Russian saving market has been the inability to choose any other strategy than the high risk strategy of offering high interest rates. This strategy did seldom lead to increase in market share, but it did lead to relatively risky investment strategies. As a result many of these banks were highly vulnerable to changing economic circumstances. Large incumbent banks offered lower interest rates but used advertisements to attract customers. They were able to make high profits, especially when able to profit from the GKO market. Small banks provided little threat to the large banks and – despite the high number of firms – competition was low. The estimates of the Barros and Modesto model show that in some quarters the degree of competition was so low that it could not be estimated.

During the interbank-crisis a lot of the small banks defaulted and for the remaining ones the market situation detoriated. Potential depositors became aware of the risks of bank failure and the vulnerability of small banks in this respect. The consequence of the relatively high hazard rate became expressed in a high 'lemon'-premium asked by saving households, if they were contemplating to deposit their savings in a new or a small bank.

Our conclusion is, that the Russian 'new-entry' approach has partly failed, because the accompanying instability of (small and young) banks going bankrupt has had serious effects for the Russian bank sector and the savers’ confidence. Also Russian policy has changed in reaction to events in the banking sector. Influenced by Western advisors the Russian government articulated the concentration tendency. The requirements for banking licences were raised and big banks were offered the privilege to enter the primary GKO-market, which was not only sheltered from outsiders, but also from foreign competitors. For this reason the

group could make huge profits, but exclusively on state securities with very short maturities. Russia could not return to the 'rehabilitation-route', but for the time being it has clearly chosen for stability. However, in the long run it can not be efficient, that attractive loans to the government are pushing aside investment opportunities in business.

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Table 1. Household savings in Russia (1992 - 1998)

Saving categories in % of disposable income	Year 1992	1993	1994	1995	1996	1997	1998
Deposits and securities	5.2	6.7	6.9	5.2	5.3	2.4	1.2
Household savings	20.1	25.4	28.5	24.4	26.7	26.9	16.4

Source: Russian Economic Trends (1999)

Table 2: Market share data for the 14 quarters

Quarter	N	$N_{s>0.5\%}$	$N_{s>5\%}$	S_{max}	S_{mean}	N_{used}	$S_{mean,used}$
94.I	39	22	3	33.0	2.56	x	x
94.II	47	25	6	18.5	2.13	x	x
94.III	54	37	6	18.0	1.85	35	2.27
94.IV	56	35	5	22.9	1.79	41	1.85
95.I	55	36	7	11.8	1.82	45	1.86
95.II	56	40	5	12.6	1.79	49	1.99
95.III	53	33	4	15.9	1.89	49	2.01
95.IV	48	34	4	14.6	2.08	45	2.18
96.I	48	31	4	15.4	2.08	43	2.25
96.II	45	27	7	16.3	2.22	41	2.41
96.III	39	27	7	13.4	2.56	34	2.88
96.IV	36	26	8	12.2	2.78	29	3.31
97.I	31	24	8	13.4	3.23	28	3.42
97.II	30	23	8	14.4	3.33	30	3.33

Note: N is the total number of firms. $N_{s>0.5\%}$ is the number of firms with more than 0.5% market share. $N_{s>5\%}$ is the number of firms with more than 5% market share. S_{max} is the maximum market share in the period. S_{mean} is the average market share (1/N). N_{used} is the number of firms for which all data for the multinomial logit estimation procedure are available. $S_{mean,used}$ is the average market share of these firms.

Table 3: Interest rate data for the 12 quarters used in the market share analysis

Quarter	INT_{mean}	INT_{min}	INT_{max}	INT_{std}	INT_{cv}	corr(INT,S)
94.III	83	55	98	11.2	0.135	-0.27
94.IV	65	45	75	8.1	0.125	-0.31
95.I	84	60	100	10.5	0.125	-0.39
95.II	111	80	130	12.3	0.111	-0.37
95.III	96	70	112	9.0	0.094	-0.30
95.IV	78	60	88	7.3	0.094	-0.36
96.I	74	45	91	10.9	0.147	-0.32
96.II	65	45	80	9.6	0.148	-0.09
96.III	62	45	72	6.0	0.097	0.06
96.IV	50	34	60	6.1	0.122	-0.08
97.I	36	20	39	3.8	0.106	0.19
97.II	25	18	28	2.3	0.092	-0.06

Note: INT_{mean} is the average interest rate of firms for which all data for the estimation procedure are available. INT_{min} and INT_{max} are the minimum and maximum interest rate offered. INT_{std} is the standard deviation of the interest rate and INT_{cv} is the coefficient of variation (ratio of standard deviation over mean). The column of corr(INT,S) gives the correlation coefficient between the interest rate and the market share of firms.

Table 4: The firms in the assets TOP8

name	# quarters in TOP8	share 95.IV	share 97.II
Incombank	14	14.6	14.4
Russian Credit	14	7.6	3.7
Alfa-Bank	10	2.0	6.3
Stolichniy Saving Bank	14	4.1	8.3
Sber Bank RF	14	4.7	12.2
Imperial Bank	4	0.7	1.0
Avtobank	3	3.4	7.1
Menatep-Bank	11	3.0	3.6
Unicombank	4	2.2	3.0
East-West Bank	10	12.5	9.3
Promstroybank	8	4.7	7.9

Note: The firms have been in the top 8 of firms with highest assets at least during three out of 14 quarters. The Moscow three months deposits market shares for the fourth quarter of 1995 and the second quarter of 1997 are given in the last two columns.

Table 5: Average valuation of seven criteria of attractiveness in VCIOM-survey

Categories	Mean	Deviation of mean for savings only in Cash	Sberbank	Private bank
Reputation	4.35	-0.27	0.12	0.23
Interest Rate	3.98	-0.29	0.13	0.41
Scope of Services	2.77	-0.14	-0.43	0.81
Advises of Friends	2.74	0.17	-0.30	0.47
Location	2.44	-0.29	0.49	0.01
Annual Balance Sheet	2.04	-0.17	-0.26	0.89
Advertising	1.47	0.05	-0.13	0.39
Average	2.83	-0.13	-0.05	0.46

Note: Total number of respondents with savings was equal to 865. The number of respondents with their savings only in cash were 374, those with their savings only in the Sberbank were 272 and those with their savings only in private banks were 118. The range of valuation given by the respondents for the categories was 0 (not important) to 5 (very important). Source: Yakovlev (1998), p.115, in Avdasheva (1998).

Table 6: Estimation results for the market share equation of LNSHARE

Variable	Only Incumb.	Only Incumb.	Ent+Ext Incl.	Ext Incl.	Ent Incl.
LN(1+INT)	-0.139				
	(0.406)				
LN(1+INT)*TOP8	0.257**				
	(0.113)				
LN(1+A(-1)+A(-2))	0.037**				
	(0.019)				
LNSHARE(-1)	0.848***	0.887***	0.732***	0.817***	0.790***
	(0.022)	(0.019)	(0.034)	(0.033)	(0.025)
LNSHARE(-1)*PC	0.088***	0.095***	0.224***	0.166***	0.164***
	(0.029)	(0.036)	(0.030)	(0.048)	(0.038)
R^2	0.911	0.908	0.684	0.746	0.822
N	469	469	541	514	496

Note: *,** and *** indicate significant at the 10%-, 5%- and 1%-significance level, respectively. Time dummies are included. Standard errors between brackets. In the third column entries (Ent) and exits (Ext) are included next to the 469 observations of incumbents of the first two columns, in the fourth column exits are included and in the fifth column entries are included. The supposed market share the quarter before entering (for entrants) or the quarter in which they exit (for exiting banks) is 0.001. PC stands for a dummy variable which is 1 in the post liquidity crisis period, 0 before.

Table 7: Estimation results for the lags of advertising in the market share equation

Lag included	0	1	2	3	4
Coefficient	0.018	0.031**	0.034**	0.001	-0.003
(t-value)	(1.4)	(2.2)	(2.3)	(0.1)	(0.2)

Note: *,** and *** indicate significant at the 10%-, 5%- and 1%-significance level, respectively. The model is identical to the first column of Table 6 with log(1+A(-1)+A(-2)) substituted by log(1+A), which is denoted by lag 0, log(1+A(-1)), denoted by lag 1, up till log(1+A(-4)), denoted by lag 4. For each of the regressions we require that data on A through A(-4) are available. This requirement reduces the number of observations to 342.

Table 8: Strategies, age, market share and financial resources

	Strategy 1	Strategy 2	Strategy 3	Strategy 4
Interest rate	High	Low	High	Low
Advertising	High	High	Low	Low
N	128	156	169	117
Share	0.026	0.038	0.009	0.016
Top8	26.6%	44.2%	4.1%	17.1%
Licency date	92.8	91.8	93.2	92.1

Note: When the interest rate is above the (unweighted) average of the interest rate within each quarter then the stragey is called a “high” interest rate strategy otherwise it is called a “low” interest rate strategy. When the amount of advertising is below the median amount of advertising for the entire period (33) then the strategy is called a “high” advertising strategy otherwise it is called a “low” advertising strategy. N is the number of observations for which a certain strategy is found. ‘Share’, ‘TOP8’ and ‘Licency date’ are the average market share, percentage of TOP8 (high assets) firms and the average licency date for the observations assigned to each of the four strategy groups. Data from 1994.II on are included in this table. For the Sber-Bank a licency date of 1980 is chosen, although the bank was founded shortly after the Russian Revolution.

Table 9: Probability of exit for the four strategy groups

strategy	1	2	3	4
probability of exit from strategy	0.05	0.12	*0.60*	0.23

Note: for each exit the last strategy observed is used to assign the exit to a certain strategy.

Table 10: Summary statistics for the period 1994.II to 1997.II

Quarter	Average rate	N	Average rate TOP8-banks	GKO yield	CPI quarterly rates	EXR
94.II	113.64	50	101.67	209	29.0	18.3
94.III	83.30	57	76.43	115	19.4	12.4
94.IV	65.27	56	59.30	97	30.0	49.3
95.I	83.98	59	76.30	266	57.3	31.6
95.II	111.23	62	103.50	232	31.2	26.7
95.III	96.61	59	89.50	104	21.3	-13.4
95.IV	77.78	51	75.09	165	14.4	1.3
96.I	74.63	51	68.82	152	12.3	5.1
96.II	65.53	45	62.55	80	8.0	4.4
96.III	62.62	39	63.18	157	3.6	5.0
96.IV	49.77	31	50.18	69	1.3	5.0
97.I	35.55	29	35.91	44	5.7	3.3
97.II	25.43	30	25.73	30	4.0	2.0
Mean	72.72	47.6	67.59	132.3	18.3	11.6

Note: The average interest rate is in % per annum for all N banks and for the TOP8-banks. GKO yield is on the secondary market *one quarter lagged*. GKO yield is % per annum. The change in Consumer Price Index CPI and Exchange Rate EXR (versus the US dollar) are % per quarter (also one quarter lagged). The GKO, CPI and EXR data are compiled from the Russian Economic Trends data source, SITE.

Table 11: Estimation results for the extents of competition throughout the period 1994-97

Quarter	$\hat{q}_t$	$\hat{s}_{\hat{q}_t}$	n_t	g_t / b_t
94.II	0.0013	0.0005	39	0.00
94.III	0.0068	0.0004	46	0.03
94.IV	0.0051	0.0006	47	0.02
95.I	-0.0142	0.0012	48	[-0.01]
95.II	-0.0015	0.0004	53	[-0.00]
95.III	0.0088	0.0003	53	0.17
95.IV	-0.0025	0.0008	46	[-0.00]
96.I	-0.0015	0.0008	45	[-0.00]
96.II	0.0088	0.0006	43	0.06
96.III	-0.0092	0.0015	36	[-0.01]
96.IV	0.0101	0.0013	30	0.05
97.I	0.0134	0.0017	29	0.10
97.II	0.0134	0.0027	30	0.11
Mean	0.0030		41.9	

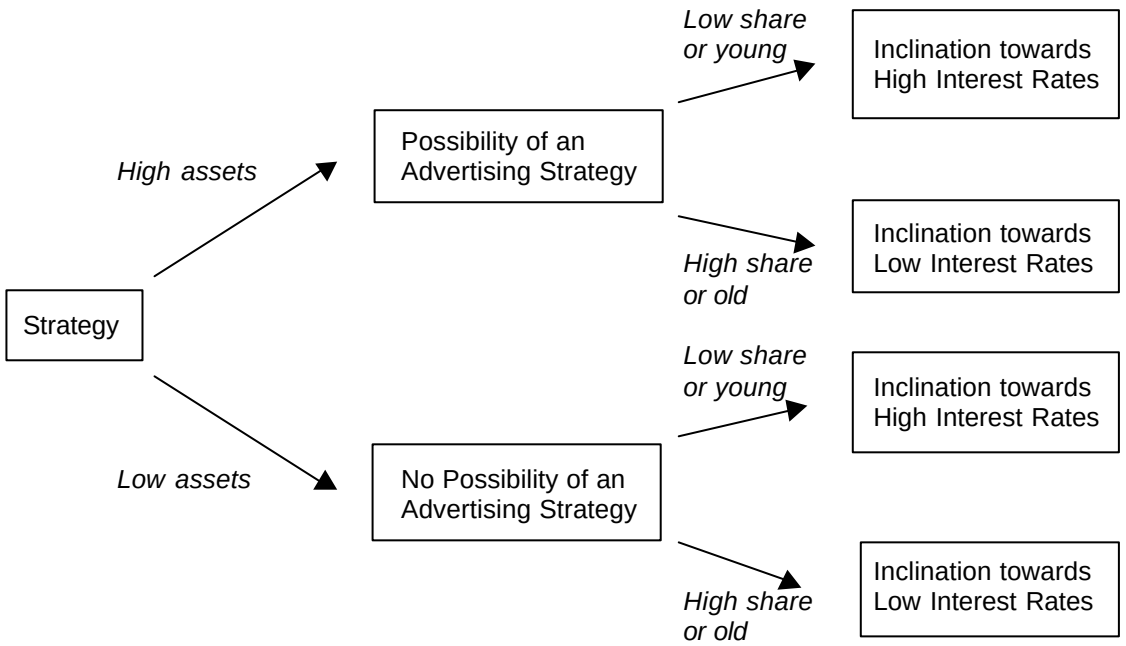
Note: The first part of the table presents the least squares estimation results of the q_t for all the firms which have the necessary data available. The implied values of g_t / b_t are given in the last columns. Estimates for the effects of the factors of attraction and the R^2 are given in Table 12. The total number of observations is 545.

Table 12: Estimation results of the factors of attractiveness and the R^2

	ln(1+A(-1))	SHARE(-1)	LIC	TOP8	R^2
w_j	0.028 (4.4)	0.855 (3.1)	-0.059 (6.2)	-0.031 (1.3)	0.888

Note: The table gives the estimates for the effect (w_j) of the factors of attraction and the R^2 for equation (14). T-values between brackets. The total number of observations is 545.

Figure 1: Possible strategies for saving banks



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