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THE EVOLUTION OF BANK CREDIT QUALITY IN TRANSITION
THEORY AND EVIDENCE FROM ROMANIA

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Abstract

The paper develops a simple theoretical framework of financial discipline during the stabilization of a transition economy, from which it derives an empirical measure to assess whether the banking sector has started to act as a source of financial discipline, or just as a temporary buffer for enterprise losses. The model suggests that in the presence of active bank monitoring the correlation between bank lending and arrears should be decreasing over time, while it would increase if banks rolled over bad loans in the expectation of a bailout. We run the test on balance sheet data from a sample of Romanian state-owned enterprises over 1991-1994. We find evidence that, contrary to the findings of Pinto and van Wijnbergen for Poland, credit criteria used by Romanian banks show few signs of improvement. Most worrisome is the stability of the relation between bank credit and financial arrears, which seems to increase in strength over the period and remains very significant both statistically and in terms of economic impact. Bank credit appears negatively correlated with profitability; however, there is evidence that this is the result of better firms reducing their demand for credit as real rates rise. Reassuringly, credit to these firms depend positively on their receivables, while bank arrears have a insignificant impact. However, firm size was a significant determinant till 1993 and trade arrears become a strong determinant of credit in 1994. Banks appear to particularly soft towards the worse performing firms, particularly towards larger and more insolvent enterprises. There is evidence of a structural policy shift in 1993-1994 with banks refinancing trade arrears, perhaps following IMF pressure against further central bank bailouts of such arrears. Overall, the evidence suggests a largely passive attitude of banks towards the worse borrowers and only limited reallocation of credit to better users.

-Keywords: restructuring, financial restructuring, bank lending in transition.

Introduction

This paper examines whether the economic reforms started in 1990 have been effective in tightening financial discipline on Romanian state-owned enterprises.

At the onset of economic reform, there were strong similarities across all Central and Eastern European economies in the structure of SOEs funding. As direct credit programs and subsidies were sharply reduced in this period, bank lending became a crucial source of outside finance for the state-owned sector.

While macroeconomic indicators are most commonly used to assess the performance of an economy and its reform process, microeconomic adjustment is the sole guarantee of long term performance. A tight credit policy which reduces inflation may be unsustainable when available credit is used to cover losses. As enterprises fail to generate an appropriate return, and decapitalize by paying insiders most of their surpluses, in the medium term the banking sector will reveal its insolvent state, requiring massive recapitalization and thus lax monetary or budget policies. The importance of a timely assessment on the quality of bank lending is thus essential to assess progress in restructuring incentives and in the reallocation of credit to better producers.

Studying the disciplinary role of the banking system on enterprise restructuring requires data on the true amount of bad loans and the quality of new credit. The information provided by banks is hardly reliable. An alternative is to assess the data related to bank borrowing and arrears from the SOE's yearly balance sheets.

Pinto and van Wijnbergen (1994), analyzing balance sheet and survey data from Polish SOEs, show a breakdown in the negative correlation between SOEs profitability and their access to new credit, and conclude that a structural break took place in the behavior of Polish banks as a result of a broad reform of the banking system in 1992.

Regressing observed changes in bank credit on profitability to verify the sign of the correlation is not informative, as this cannot separate supply and

demand effects. In principle, high profitability is positively related to credit supply (banks like to lend to good firms); but as real interest rates rise during stabilization, credit demand by better firms may drop. In contrast, the worse firms do not mind accepting high interest rates, as they do not plan to repay. Pinto and van Wijnbergen address this issue by using survey data on firms' perceived ease of obtaining credit, which allows a partial identification of the demand curve. Other surveys have been aimed at measuring the underlying attitude of lenders and borrowers toward lending, borrowing and repayment. Kotzeva and Perotti (1995) conduct a survey among managers of Bulgarian SOEs aimed at measuring subjective attitudes towards extending trade credit. They find evidence of opportunistic lending and borrowing behavior based on the expectation of a collective bailout.

The approach in this paper is based on a simple theoretical model, which identifies the change over time of the correlation between bank credit and bank arrears as an empirical measure of the evolution of bank lending quality. Per se it is not surprising to observe a strong initial correlation between these two values. On the one hand, in a transition economy subject to large trade and price shocks, many firms would initially suffer from the sudden price adjustment; moreover, banks may have a hard time at first identifying the quality of borrowers and reducing their exposure to unprofitable enterprises. If appropriate microeconomic reform takes place over time, however, it should be possible to observe a progressive improvement in the composition of bank lending. If on the other hand banks are subject to political pressure, or if they act on the assumption of a generalized recapitalization of bad loans, they may direct credit to less creditworthy but politically sensitive enterprises. In the presence of implicit guarantees there may be perverse incentives even on the part of profit-maximizing banks to continue to direct credit to the worse former borrowers (Perotti, 1993).

We apply these ideas to a sample of Romanian state enterprises for the years 1991 through 1994, both as a whole and stratified by performance (profitability). The Romanian banking system has faced a considerable degree of decapitalization

as a result of inflationary pressure and a large stock of nonperforming loans, and its situation is delicate.

Our results are not encouraging. Our empirical analysis indicates that the correlation of bank lending to the stock of financial arrears, controlling for profitability and trade receivables as well as to firm size and employment, is increasing and strengthening statistically. Bank credit appears to be directed increasingly towards firms that are on average larger, less profitable, and have larger arrears position in trade and bank credit. We also conclude that credit appears correlated negatively with profitability because during tight policies there is less demand by "better" firms. Even lending to "better" firms seems to contain some bias towards those with the largest trade arrears. The evidence suggests that bank credit in 1993-1994 has replaced state subsidies of 1990 and direct bailouts of trade arrears of 1991-1992. We conclude that a large part of bank credit among SOEs in Romania is used to prop up the worse firms rather than fund the enterprises with better prospects. As in the case of the inter-enterprise arrears in Russia, both the accumulation of arrears and the distorted allocation of bank credit to state sector enterprises are a consequence of the "inconsistencies in the economic reform program combined with underdevelopment of the financial system" (Ickes and Rytman).

Section I develops a simple model of the incentives for banks to be active monitor of firms' quality and performance as a function of current and (expected) future monetary policy. It is difficult to measure directly the evolution of monitoring. The model identifies a simple observable measure of qualitative changes in the allocation of credit over time based on the evolution of the correlation coefficient between bank lending and arrears. Section II briefly describes the economic context of the Romanian reform process, describes the sample and presents our empirical results. We offer some conclusions at the end.

SECTION I

The model

The model has three periods, characterized by the prevailing monetary regime. Their sequence is not justified on the basis of an optimal monetary policy, but rather reflects the historical experience of macroeconomic transition in Romania and most other countries.

In the first period, price liberalization is associated with high inflation, presumably to accommodate partially the price shock across sectors. It is followed by a period of tight credit policy. The last period results in either a reversal of this tight policy, occurring with ex ante probability q_0 , or the transition to stable monetary conditions.¹ More information on the probability of a credit relaxation becomes available in the second period. The change in monetary conditions determines the level of real interest rates, which are r during a lax policy and R during a tight policy regime, with $R > 0 > r$.

Enterprises may be either viable or nonviable; only viable firms can repay their debt. Each enterprise may wish to borrow one more unit of capital. Viable enterprises, if funded, invest and produce positive added value, with a gross return of $\theta > 1$. Because these firms expect to have some positive residual value after debt repayment, they are sensitive to the cost of credit. Nonviable enterprises, if funded, consume these resources to fund losses and produce a net negative added value of $\gamma < 1$. As these firms do not expect to repay their loans, their loan demand is less sensitive to the level of the real interest rate.

Banks have a stock of old loans, and can choose to lend to any enterprise, within the limits of available funds. Even after a poor borrower is identified, it is particularly difficult to force repayment, because of a poor legal framework and thus a difficult enforcement process. We focus here on bank monitoring as the active intervention on poor borrowers which results in the enforcement of repayment and thus allows for a reallocation of credit to better borrowers.

¹ For a model which endogenizes the probability of reversal, see Perotti (1995).

Monitoring requires effort to succeed. Monitoring a fraction of borrowers leads to a potential recovery of an equal fraction of bad loans and to the freeing of resources. These can be lent to viable firms, whose repayment is certain. However, a level of monitoring λ requires a cost $c(\lambda)$, which reflects the difficulty of enforcing repayment and recovery of collateral as well as the political obstacles to reduce funding to poor performing enterprises. We assume that $c(0)=0$, $c'(\lambda) >0$, $c''(\lambda)>0$, $c(1)=\infty$. Note that 100% monitoring is not cost-efficient.

Arrears are reported as a constant fraction $\alpha \in (0, 1]$ of actual overdue loans. The face value of the stock of bad loans is defined by F . Thus, if at the beginning of the period a fraction λ is repaid and the rest rolled over at the prevailing rate $i = \{r, R\}$. Thus the reported amount of remaining outstanding bad loan will be $\alpha(1-\lambda)L(1+i)$.

During a lax monetary policy the real interest rate is so low that all borrowers can actually repay their loans. Specifically, we assume that $1+r=\gamma$, so a lax monetary policy amounts exactly to an ex ante bailout of all loans, since any enterprise can repay such a negative real rate of interest on its loan.

In contrast, during a tight policy regime the real interest rate is high enough that the nonviable firms could repay only up to $1+r = \gamma$ which is less than 1. In addition, all viable firms such that $\theta < R$ could not earn enough on their investment to cover the high interest cost; as a result, these viable firms will not borrow, so credit demand is of lower average quality.²

Finally, in the last period the government chooses whether to reverse its tight monetary policy in order to bail out the bad loans of the banks (and compensate them for their partial write-off on these loans). Thus if there is a bailout the bank receives the entire face value of all bad loans. The probability of a bailout is known and common for both bankers and enterprises. At time 1 the prior belief is that a bailout will occur at time 3 with probability q_0 ; at time 2 some more

² Two extreme possibilities are that the supply of depositors' money and central bank credit in the second period is so low that banks would not be able to extract from poor borrowers enough resources to lend to better firms. Alternatively, it is possible that the credit demand shift by better firms constrains the overall credit demand and discourages banks' monitoring. An endogenous real interest rate should rule out such cases, so in our treatment we rule out both scenarios.

information on future government policy is available, and q_0 is either revised downwards to q_L or upwards to q_H , with equal probability $1/2$, where $q_H > q_L$ and $q_0 = E[q_1] = 1/2[q_L + q_H]$.

On average, better loans are more desirable since the expected return is higher than for bad loans rolled over, as the bailout occurs only with some probability. The return to a good loan is certain and equals $(1+r)(1+R)$, while the return on a bad loan is either $(1+r) = \gamma$ if no bailout takes place or $1+R$ if it takes place, and equals

$$q_0(1+R) + (1-q_0)(1+r) \equiv R_B \quad (\text{where } r < R_B < R).$$

In each period bankers choose monitoring (and thus the allocation of lending between good and bad borrowers) based on maximizing their final profit net of each period's effort costs, subject to the constraint that total lending cannot exceed the total stock of resources available for intermediation:

$$\text{Max } \lambda E_0[V_2] - c(\lambda_1) - \delta c(\lambda_2)$$

subject to:

$$L_t = L_{Gt} + L_{Bt};$$

$$L_{G1} = L_0 \lambda_1 \quad (\text{which leads to a safe return of } L_0 \lambda_1 (1+r)(1+R))$$

$$E_0[V_2] = \lambda_1 L_0 (1+r)(1+R) + (1-\lambda_1) L_0 (1+r) [\lambda_2 (1+R) + (1-\lambda_2)[q_0(1+R) + (1-q_0)(1+r)]]$$

The FOC for the optimal first period is:

$$\partial W / \partial \lambda_1 = 0 = -c'(\lambda_1) + \delta L_0 (1+r) (1-\lambda_2(q_1)) (1-q_0) [R-r]$$

where $\lambda_2(q_1)$ is the expectation of the second period monitoring choice, which is a function of the posterior beliefs q_1 .

Notice that as q_0 increases, the expected return to lending to poor borrowers R_B increases. Differentiating the marginal cost of λ_1 with respect to q_0 (assuming a constant expected q_1) indicates that in equilibrium a higher probability of a bailout decreases monitoring:

$$\partial c(\lambda_1) / \partial q_0 | \lambda_2 \text{ constant} = -\delta L_0 (R-r) (1+r) (1-\lambda_2) < 0$$

which implies that λ_1 drops, as $c(\lambda)$ is monotonically increasing and $R > r$.

In fact, if $q_0=1$ then it is as if the lax monetary policy were continued, and there are no incentives for banks to exercise monitoring, so $\lambda_1 = \lambda_2 = 0$.

Consider now the incentives to monitor at time 2. Let their stock of inherited bad loans be $(1+r) L_{B1} = (1+r)(1-\lambda_1)L_0$, which reflects the accumulation of unpaid interest on the stock of bad loans at time 1. Maximizing expected profits net of monitoring costs at time 2 requires to:

$$\text{Max}_{\lambda} E_1[V_2] - c(\lambda_2)$$

where $E_1[V_2] = L_{G1}(1+R) + L_{B1}[q_0(1+R) + (1-q_0)(1+r)]$

subject to the constraint that unmonitored bad loans are rolled over and that total lending to good and bad firms cannot exceed the total stock of resources made available for reintermediation through monitoring:

$$L_{G2} = L_{G1}(1+r) + L_{B1}\lambda_2(1+r)$$

The first order condition is

$$\text{FOC } \partial W / \partial \lambda_2 = 0 = -c'(\lambda_2) + L_0(1+r)(1-\lambda_1)(1-q_1)[R-r]$$

The main results, easily derived by observation, are that

- in equilibrium some amount of monitoring takes place in the first period to save on convex monitoring costs as long as $q_0 < 1$;
- *holding q constant in both periods*, monitoring is more intense in the second period only in the presence of discounting;³
- in the absence of discounting, the actual ex post level of monitoring in the second period will be higher than in the first period when the posterior belief are q_L and lower when they are q_H ;
- in the presence of significant time discounting, the level of monitoring in the first period may be lower than in the second period even if $q_1 > q_0$.

Consider now the reported levels of arrears at time 1 and at time 2, which are related to loans to nonperforming firms:⁴

³ To see this, simply write out the ratio of the equilibrium marginal cost of monitoring in the two periods for a constant q .

$$ARR_1 = \alpha L_0(1+r)(1-\lambda_1);$$

$$ARR_2 = \alpha L_{1B}(1+r)(1+R)(1-\lambda_2(q)) = ARR_1(1+R)(1-\lambda_2(q))$$

The level of arrears at 2 is correlated with the posterior beliefs on the probability of a bailout q through its impact on the chosen level of monitoring λ_2 at 2.

In the simplest case of no discounting, as the probability q is either higher or lower at time 2 than at 1, then it follows that the percentage of bad loans may either rise or drop:

$$ARR_2(q_H)/L_2 > ARR_1/L_1 > ARR_2/L_2(q_L)$$

In conclusion, the correlation between bank credit and bank arrears is a good proxy for the underlying degree of credit tightening taking place over time. When the degree of financial discipline is increasing, this correlation should become weaker over time, and the decrease would be all the more pronounced the more the perceived probability of a collective bailout has decreased as a result of an increasing reputation for monetary stability.

Empirically, this can be translated in a prediction on the evolution over time of some coefficients on the determinants of bank lending to individual enterprises. Specifically, in a regression explaining bank borrowing in terms of the borrower's balance sheet figures, the coefficient on bank arrears should decline over time in absolute terms as banks tighten credit assessment.

In contrast, if the incentive for monitoring declines because of lack of monetary credibility (as bad loans are increasingly expected to be bailed out), there may be no improvement in the cross-section correlation between arrears and the stock of bank credit.⁵ This would signal to poor credibility of future monetary

⁴ The reported arrears at t reflect loans which are expected to be nonperforming at $t+1$. If instead we defined them as the current nonperforming loans, the reported arrears would come at the end of the first and second period respectively.

⁵ The more extreme empirical result would be that the correlation between arrears and lending were to **become stronger** over time. In this case we could not ignore the possibility of a positive bias in favor of worse borrowers due to the equity-like nature of overdue debt, which means that there are greater benefits for banks in refinancing old loans than in offering loans to new firms (Perotti, 1993).

policy, resulting in a drop in monitoring intensity and ultimately a serious banking crisis.⁶

On the other hand, it is not possible to interpret a negative correlation between credit and profitability as a sign of poor lending quality, as the loan portfolio composition depends also on demand effects: good borrowers may choose to reduce their borrowing during tight credit, when real interest rates are higher.

SECTION II

2.1 A brief history of the Romanian financial transition

Until 1992 an important source of funding for SOEs consisted of direct government subsidies for the state enterprises. The agreements signed in 1991 and 1992 between the Romanian government and the International Monetary Fund required a drastic cut in such subsidies. In order to be able to receive the IMF structural adjustment loans, explicit subsidies were cut dramatically. In 1993 in the balance sheets of most SOEs subsidies were reported to be zero. The main responsibility for further financial discipline on enterprise shifted thus to the banks.

The state sector is still currently the major borrower in Romania. Although the private sector accounts for an important share of GDP (estimated at 35 % in 1993, as reported by Business Central Europe, 1994) and for 59% of the number of employees in Romania (Croitoru and Ciocirlan, p. 2), the private sector still accounts for only a small part of total bank borrowing (19.5 % in December 1994⁷). An assessment of the quality of the loan portfolio seems critical, particularly in the light of the recent Bulgarian banking crisis.

Before 1989, the Romanian financial system served only as a channel for subsidies to enterprises. The monolithical National Bank had control over the flow of funds, and deployed them to state-owned enterprises according to a five year plan (Brainard, p.15). The only bank which had some of the prerogatives of a

⁶ Lack of discipline may be self-reinforcing and self-fulfilling when the incentive to lend to poor performers (related to the bailout probability) rises with the overall stock of bad loans (Perotti, 1995).

⁷ NBR-Monthly Bulletin No. 12/1995

commercial bank was the Bank for Foreign Trade. The main source of funds was the Savings Bank (CEC), which had a monopolistic position as a retail bank paying (low) interest rates on people's savings. Real interest rates were kept very low. The financing of long term investments was carried out through the Investment Bank. Enterprises did not have any incentive to repay loans, as future credit was independent of past repayment and no mechanisms were in place to enforce credit contracts. These features were common to all former Communist economies, although the degree of overlending did vary across countries (Perotti, 1994).

An early financial crisis developed in Romania within the state industrial sector following a first attempt at macroeconomic stabilization in 1991. The stock of inter-enterprise arrears rose rapidly 18-fold, until it amounted to a stunning 50% of Romania's GDP. The implementation of the Global Compensation Scheme (GCS) in December 1991 did not bring any considerable improvement to the trade arrears problem (Clifton and Khan, 1993; Calvo and Coricelli, 1993). The CGS led to a massive shift of financial arrears to the banking sector and, ultimately, to the Romanian National Bank, which had to provide funds for clearing outstanding trade debts between enterprises. Following the GCS the money supply rose by 149 billion lei⁸, leading to an increase in prices of 223%, some 118% more than projected.

The basis for a cyclical pattern of tight monetary policy, rapid buildup in arrears and finally centralized bailout had been established. The money supply remained almost unchanged from November 1990⁹ until April 1991, increasing then by December 1991 by 71 %. Tough interest rates were formally liberalized during 1991, certain constraints (Croitoru and Ciocirlan, 1994) imposed severe limits on interest rates becoming real-positive. The interest rates for credits offered by commercial banks in Romania in 1992 and 1993 varied considerably (during December 1992, for instance, interest rates for credits ranged from 15 % to 180%, another sign that a dual market for credits was effective during at least 1992 and 1993).

⁸ Clifton and Khan, 1993, p. 690

⁹ Croitoru and Ciocirlan, 1994, p. 3

In May 1992 the NBR shifted policy again, and interest rates on loans offered by the main state-owned banks, calculated on a quarterly basis, became positive in real terms for a short period during the second and third quarters of 1992; following a new credit relaxation they then plunged, only to become again positive at the beginning of 1994. The imposition of quantitative ceilings for refinancing around that date gave a clear sign that the NBR was attempting to stem the amount of credit offered by commercial banks to its borrowers. Interest rates on inter-bank credit auction rose to 184% in March 1994.

Commercial banks managed to shift these high levels of interest rates on overdraft corporate loans, suggesting that loan demand was quite inelastic during this period. As argued below, this may in part reflect the fact that many uncreditworthy firms maintained a high level of loan demand. The hyperinflationary environment and thus the decapitalization of the banking system greatly diminished the commercial banks' lending capacity. Between August 1993 and February 1994 the share of inter-bank auction and overdraft funds in the commercial banks' sources increased 35-fold, from 1.4% to 50%, then decreasing somewhat by August 1994 to some 33%.

Although bank credit was restricted both by means of "official" interest rates and quantitative ceilings imposed by the NBR, there were signs that the Government implicitly subsidized interest rates for some firms. Enterprises faced two different interest rates: the "official" and the "preferential-subsidized" interest rates. This "dual" interest rate was just one of the signs of financial "softness" in the Romanian financial system.

The NBR has progressively tightened its norms for commercial bank lending; as a result, all commercial banks in Romania have at least nominally developed internal procedures for loan origination and risk control. Assessing their performance is in our opinion a crucial predictor of future financial solvency and economic performance for Romania. It would not be the first time when stringent loan conditionality based on macroeconomic measures is fulfilled by transferring the burden of subsidies to the balance sheets of the banking system.

Basic question and methodology

We use a simple working model of enterprise demand for credit over a period of attempted monetary stabilization. Initially, Romania experienced in 1990-91 an hyperinflationary environment, with very negative interest rates on loans; demand for credit is then unlimited and needs to be rationed. As Romania started a more determined stabilization policy in 1992-93, real interest rates rose; by late 1993 loans rates became positive and at times quite high. Enterprises which were profitable, or more in general had good future prospects, presumably became more sensitive to the high cost of credit. Although they have the best use for more financial resources, they could not expect financial relief and thus had some incentive to protect their residual value by reducing their demand for loans. In contrast, firms with the worse prospects would not be as concerned with the high rates, as they are not as likely to repay them anyway; their incentives are skewed towards short term objectives and possibly towards higher risk undertakings (Stiglitz and Weiss, 1984). For this subset of firms demand for credit is unlimited; the volume and allocation of credit are therefore determined by the suppliers of capital, the banks. In conclusion, for better firms credit allocation is more determined by demand, while for worse firms it is supply-driven. The question thus is what lending supply policy was followed by the banking sector.

In general it is not easy to distinguish from demand and supply effects on the allocation of credit. Simply regressing the stock of bank credit on the level of profitability of the borrower cannot allow us to assess the quality of lending performed by the banks. While better firms deserve more credit, they may demand less; so a negative coefficient on profitability may still be consistent with banks lending to the best enterprises on the demand curve they face.

Pinto and van Wijnbergen address this problem by using survey responses in addition to balance sheet data; their measure of financial constraint may identify a subjective measure of “scarcity of funds”, which is related to loan demand.

In our approach we make use of balance sheet information on the stock of bank and trade arrears. If banks were lending on the basis of the capacity and

willingness to repay, they should be withholding loans from firms with a history of unpaid loans and overdue trade liabilities. As the model in Section I indicates, credit would be positively correlated but progressively decreasing in the amount of financial arrears (after controlling for firm profitability). Over time, a strengthening of this decline would reflect tighter financial constraints. We would also expect that scaled bank credit be independent of firm size¹⁰ and positively related to the stock of trade receivables (a measure of short term assets to be funded), after controlling for its overdue component.

¹⁰ Political pressure may influence the allocation of bank credit directly or through promises of financial relief for loans to preferred firms. However, it is difficult to find proxies for firms which may be natural constituencies of government supporters. Size may then measure the political bargaining power of large enterprises. Interestingly, it results that in Romania size has a positive impact but employment has a negative effect, suggesting that the government favors capital intensive sectors.

Description of sample data

We analyze balance sheet data collected from two samples drawn from the same source, the list of state owned enterprises in the “Transylvania” III Private Ownership Fund’s portfolio. The first sample includes data over 1991-93 from 256 state-owned enterprises, the second includes 345 enterprises over 1992-1994.

After the Privatization Law was enacted (Law 58/1992), the institutions which had the prerogatives of interim management of SOEs, for their ownership share of 30% of each SOE, were called the Private Ownership Funds (POFs). The POF 3 in Brasov is one of the five such ownership funds, which on a regional basis exercise control and governance over some 1,300 formerly state owned enterprises each. This means that the POFs have people to represent their interests in each of the enterprises part of their portfolio. Moreover, since POFs are shareholders in these SOEs, they have access to balance sheet data. The POFs play, in addition to their control and governance attributions, an important role in the Mass Privatization Process in Romania. The privatization vouchers issued in 1993-1994 and the newly issued "privatization coupons" account for the POFs ownership share in SOEs, which are to be "traded" by voucher and coupons holders for shares of stock in SOEs.

The balance sheet data reports various financial indicators, including bank borrowing and government subsidies. Data contain information about the SOEs' profits, employment, bank arrears, inter-enterprise arrears and bank borrowing. The enterprises in the sample are randomly selected from about 1,300 enterprises in the Private Ownership Fund’s 3 portfolio, distributed geographically all around Romania and from different branches. First sample data contain observations related to enterprises for 1991, 1992 and 1993. The second sample brings in observations from 1994. All the data are expressed in terms of 1991 constant Lei, the data from 1992, 1993 and 1994 being deflated with the producer price index (PPI)¹¹

¹¹ The producer price index is taken by the Monthly Statistical Bulletin of the Romanian Commission for Statistics (1994).

The first sample of 265 enterprises was selected from an initial sample consisting of 315 enterprises on the basis of completeness of data regarding employment, bank borrowing and arrears. All observations with missing variables were removed.

In addition to this first sample, we used a second sample of enterprises selected in the same way. This second sample includes a good part of the enterprises in the first sample plus an additional set of some 80 enterprises, also randomly selected from the POF's 3 data base.

We have no reason to doubt that there was any systematic criterion used for selecting the enterprises. In the POF's data base, enterprises are grouped geographically in an order corresponding with the date of their registration within the Trade Register. The sampling process was mechanical: for each county the first 5 SOEs were selected, then the next 10 were not selected, another 5 were selected, and then the next 11 not selected, and so on. The stated intent was to remove any possible identifiability of the firms in the sample. There seem to be no reasons to think of these samples not being representative. The size of the sample covers more than 30% of the enterprises in the POF's portfolio.

Empirical Testing

Our regressions examines as possible determinants of enterprises borrowing the size of the enterprises (we use their yearly sales as a proxy), the enterprises' scaled banking and inter-enterprise arrears (calculated as the amount of overdue trade credit for which an enterprise stays as net debtor, i.e. total payables in arrears minus total receivables in arrears) and the scaled net profit of each enterprise. We sometimes use scaled profitability in the regression, or use that information to stratify our sample and test whether the determinants for bank lending are different for the better and worse performing enterprises.

We first run a general regression over the two samples over 1991-1994. The basic relationship we study is:

$$BB_EMP_{it} = a + \beta_1 \cdot BAREM_{it} + \beta_2 \cdot SALES_{it} + \beta_3 \cdot IEAREM_{it} + \beta_4 \cdot PROEM_{it} + \varepsilon_{it}$$

where the dependent variable is the stock of bank borrowing divided by employment, and the independent variables are:

BAREM_{it} are total bank arrears divided by employment for each year;

SALES_{it} are real sales for each of the three years;

IEAREM_{it} are total inter-enterprise arrears divided by employment, defined here as the difference between overdue payments and overdue receivables);

PROEM_{it} are total profits over employment.

Table 1 presents the results of the regression.

Table No. 1

Variable	1991	1992	1993
SALES	-4.17407E-05 (-.446)	3.313486E-04 (1.644)	1.112097E-04 (4.007)
BAREM	-.008044 (-.074)	.333710 (.578)	.726104 (4.603)
IEAREM	.243818 (2.955)	-.101220 (-.203)	.128517 (1.573)
PROEM	.908116 (4.360)	.798123 (3.735)	-.045532 (-1.516)
Constant	77.852736 (4.320)	67.838315 (5.017)	55.148901 (3.466)
	R Square= .14695 F=9.73280	R Square= .09208 F= 5.73020	R Square=.14569 F=10.95693

The profitability of enterprises influences in a significant and positive way bank lending in 1991 and 1992, though no longer in 1993. The coefficients for the rescaled profit of enterprises decrease sharply and turn negative for 1993. This by itself is not an evidence against the hypothesis of improvement in the efficiency of bank credit allocation, as it may result from a demand shift.¹²

¹² A problem with this early sample is that enterprises reported their profits only when greater than zero, while those with losses reported zero profits and recorded losses on a separate entry, not available. This problem is not present in the second sample over 1991-1994. However, the number of enterprises reporting no profits for 1991, 1992 and 1993 does not exceed 5% of the total sample. Calvo and Coricelli (1994) also indicate a low number of Romanian enterprises reporting losses.

The coefficients on the variable SALES show an increasing correlation between the size of the enterprises and the amount of bank credit received. Until 1992 the coefficient is insignificant, but it becomes positive and highly significant in 1993. This suggests that the size of enterprises is an element of increasing bargaining power used by enterprises to gain access to bank loans.

The coefficient associated with the rescaled bank arrears is also a significant, positive and economically significant determinant of bank credit. This is the most troublesome piece of evidence: it unambiguously suggests a worsening of the criteria.

Table No. 2 below reports results for the second sample, which includes data from 1994. While a comparison is difficult, we find a confirmation of several trends.

The size of enterprises contributes significantly to explain bank lending, at least till 1994: larger firms receive proportionally more credit.

Bank arrears are a significant determinant of credit. In fact, the correlation appears to be becoming stronger and its economic significance to be increasing.

Inter-enterprise trade arrears are also acquiring in significance and economic impact. In this sample the correlation is positive and significant also in 1992.

Profitability appears to have become strongly negatively correlated with bank credit in 1993, though it is not significant in 1994.

Trade receivables, a variable available only in the later sample, has a positive sign and is significant, as it would be in a normal credit market, though only till 1993. Overall, there are signs of some ambiguous change in loan policy in 1994. It seems therefore a natural idea to see whether there are over time different trends in credit policy for the better and the worse performing firms.

Table 2

Variable	1992	1993	1994
SALES	8.75743E-05 (3.227)	8.08702E-05 (3.603)	3.08445E-05 (.976)
STBA_E	-.098895 (-.153)	1.936130 (7.569)	1.627735 (9.607)
IEA_E	.368918 (2.910)	.233291 (3.529)	.699665 (4.552)
REC_E	.247626 (2.147)	.597558 (9.228)	.062602 (.616)
PRO_E	.124387 (.708)	-.324116 (-4.342)	-.071711 (-.868)
Constant	44.470075 (2.904)	9.525264 (1.117)	36.576697 (2.953)
	R Square=.11973 F=6.66471	R Square=.46773 F=48.85781	R Square=.59042 F=80.43584

We thus split both samples in two subsamples, as in Pinto and van Wijnbergen, corresponding to the upper and the lower tail of the distribution of profitability, measured as the ratio between the firm's net profit and the number of employees. The first subset of firms includes those in the upper quarter of the distribution, the second those in the lower quarter of the distribution. The composition of the two subsamples changes from year to year. We refer to them hence as good and bad enterprises.

The case of good enterprises

For the top 25% enterprises in 1991, 1992 and 1993 in terms of performance, the results of the regressions are presented in table 3.

Table No. 3

Variable	1991	1992	1993
SALES	-9.87821E-04 (-.545)	4.298012E-04 (1.220)	7.520216E-05 (1.470)
BAREM	.068570 (.305)	-29.748707 (-1.401)	-3.292976 (-.250)
IEAREM	-.008206 (-.038)	-.042578 (-.062)	.066465 (.509)
Constant	279.070305 (4.497)	149.149028 (3.656)	95.734386 (2.007)
	R Square= .00815 F= .14508	R Square= .04585 F=.83292	R Square=.04717 F=.6508

The coefficients associated with the variables in the regression over the 1991-1994 sample do not show any significant correlation with bank borrowing; moreover, the R square is extremely low. We are thus inclined to neglect this table.

Table No. 4 reports the regression results based on a subsample of firms with similar characteristics taken from the second sample over 1992-1994. There is a marked difference between the first and second sample.

Table No. 4

Variable	1992	1993	1994
SALES	1.52218E-04 (2.330)	7.17119E-05 (3.892)	4.26191E-05 (.933)
BAREM	-56.487727 (-1.979)	-5.585524 (-1.323)	-4.328547 (-1.574)
PR_E	.206499 (.451)	-.177421 (-2.711)	-.272775 (-2.356)
IEAREM	.096173 (.402)	-.145738 (-2.758)	1.165422 (3.426)
REC_E	-.049131 (-.226)	.550920 (13.721)	.591857 (3.609)
Constant	54.821984 (.876)	-3.314487 (-.301)	12.867281 (.505)
	R Square = .14622 F= 1.91811	R Square=.84492 F=70.82991	R Square=.53610 F=15.02328

In the second sample size is positive and significant till 1994. This is a sign that for at least a significant period of time the bargaining power of large

enterprises became more important in time in their relation with banks even for good firms.

Reassuringly, bank credit is negatively correlated with bank arrears, a relationship that appears marginally significant. Much more problematic is the effect of trade arrears, which have a significant negative impact in 1993 but a significant positive effect in 1994. This structural change is intriguing; it is consistent with results reported later that better performing firms received more credit in 1994 to cover trade arrears, while poor performers received more bank loans to cover bank arrears. It may also be related to the end of the large cancellation programs of trade arrears that were completed by late 1992. In fact it is possible that since the last “selective bailout” of 1992 those firms with low initial arrears in 1993 were actually the worse ones, which then rebuilt them rapidly.

Receivables, on which we have data only in 1992-1994, are on the other hand a positive and significant determinant of bank credit for these enterprises. Finally, profitability is strongly and negatively related to credit. While this is an ambiguous sign, it is possibly the outcome of a strong reduction in the demand for credit by solvent firms reacting to sharply higher real rates of interest.

The case of bad enterprises

The results of the same regression over 1991-1993 for the lower part of the distribution of firm profitability are presented in the table No. 5. For the sample over 1992-1994, the regression results are presented in table 6.

Table No. 5

Variable	1991	1992	1993
SALES	4.861554E-06 (.9365)	.004706 (2.092)	8.209530E-05 (2.196)
BAR_E	.701031 (5.311)	-1.332031 (-1.363)	1.256099 (10.875)
IEA_E	.184477 (2.619)	96.953953 (3.392)	.047524 (.221)
Constant	33.739493 (2.403)	78.285355 (2.185)	23.098423 (1.372)
	R Square=.48379 F=16.55700	R Square=.23201 F=5.53851	R Square=.64810 F=44.20110

Table No. 6

Variable	1992	1993	1994
SALES	-1.38240E-04 (-1.148)	8.65766E-05 (2.195)	8.40262E-04 (3.239)
STBA_E	-1.973780 (-2.017)	1.602583 (4.369)	2.496327 (6.100)
PR_E	.135623 (.293)	-.133813 (-1.124)	.376078 (1.375)
IEA_E	1.663996 (3.792)	.140436 (.525)	.502388 (.610)
REC_E	1.512149 (4.065)	.286559 (.909)	-.202966 (-.530)
Constant	56.289789 (1.888)	.858126 (.077)	33.042065 (.980)
	R Square=.29197 F=4.61860	R Square=.69584 F=31.57123	R Square=.77827 F=45.62976

Some of our earlier considerations are reinforced by these results.

First of all, the size of SOEs is a significant determinant for lending to these underperforming state firms.

Unlike the allocation of credit in the subsample of good enterprises, the allocation of credit to loss-making enterprises is highly correlated with the amount of accumulated bad debt. In 1992 bank arrears do not seem significant for new credit allocation, but results for later years suggest that the more bank arrears an enterprise has, the more bank credit is allocated by banks to that enterprise.

Both the coefficients associated with trade and bank arrears show a high correlation with the amount of bank borrowing received, at a high level of statistical significance.

Bank credit appeared to be positively related to the volume of trade receivables only in 1992; this may in fact simply pick up some correlation with the trade credit that became overdue in that year and was bailed out through concessionary credit. In later years there is no significant correlation between total receivables and bank credit.

Together, these results raise a disturbing picture of an inertial, passive and possibly politically complacent banking system. While old loans may be not easily enforceable, the sheer size of the correlation indicates a strong economic significance of arrears on credit. It also points at an undermining influence of a number of large loss-making enterprises on the credibility of hard budget constraints.¹³

We now measure whether we are able to explain changes in the flow of credit, as opposed to its stock. The results of the regression are presented in table 7.

The dependent variable represents the change in bank borrowing; independent variables are the difference in the size of each enterprise, the difference between inter-enterprise arrears and bank arrears (the variable used for rescaling is the employment in each enterprise):

$$DIFBBE_i = a + \beta_1 \cdot DIFBAE_i + \beta_2 \cdot DIFS_i + \beta_3 \cdot DIFIEE_i + \epsilon_i$$

where:

DIFBBE is the difference from year to year in bank borrowing per employee;

DIFBAE is the difference in bank arrears scaled by employment;

DIFS is the difference in the size of enterprises;

DIFIEE is the yearly difference in the stock of real trade arrears per employee.

Table No. 7

Years	Variable	Estimate	Standard error	t statistic
1991-1992	DIFBAE21	-.105216	.096425	-1.091
	DIFS21	7.01095E-05	8.2554E-05	.849
	DIFIEE21	.044411	.068954	.644
	Constant	-37.947118	14.912813	-2.545
1992-1993	DIFBAE32	.451379	.149060	3.028
	DIFIEE32	-.241248	.074240	-3.250
	DIFS32	3.80628E-05	2.8990E-05	1.313
	Constant	.399376	14.964356	.027

¹³ Banks accumulating bad debt to large but politically favored enterprises presumably receive compensation though cheap credit from the Central Bank.

The only statistical significance available confirms a structural switch in 1993-1994; while in the previous year it were trade credit arrears which seemed to move bank lending (perhaps as a substitute for the bailout policy interrupted in 1992) in 1994 it appears that bank arrears are the driving factor behind the change in bank credit (possibly to repay the overdue loans made in 1993 to compensate for the lack of further trade arrears compensation!).

Table No. 8

Years	Variable	Estimate	t statistic
1993-1992	DIFBAE	1.078211	3.611
	DIFS	1.35081E-05	.390
	DIFIEE	.025891	.794
	DIFPROE	-.408531	-4.328
	Constant	-27.401962	-3.225
		R Square=.13743 F = 9.79870	
1994-1993	DIFBAE	1.414809	7.988
	DIFIEE	-.172891	-2.600
	DIFS	-5.747E-05	-1.025
	DIFPROE	-9.285E-04	-.010
	Constant	22.438511	2.334
		R Square=.34195 F = 36.24444	

The regressions over for the second sample are in Table 8. They include the variable DIFPROE, the difference from year to year in the scaled profits of enterprises.

It appears that none of the changes in variables between 1991 and 1992 are significantly correlated with the change in bank credit. In 1992-1993, bank lending increases as bank arrears increase, with strong statistical significance. By 1993-1994 the situation appears to further deteriorate: the coefficient on the response of bank credit to bank arrears is now well above one and even more significant. On the other hand, the coefficient associated with the change in inter-enterprise arrears over 1993-1994 becomes negative and significant. This may suggest that banks became more cautious when lending to SOEs with a significant stock of inter-enterprise arrears. However, trade arrears had been cleared in late 1992-early 1993 and had lost in importance by then, as the sample averages suggest (see

Appendices). Our conjecture is that bank credit by 1993-1994 was directed towards ensuring trade credit repayment, shifting arrears towards the banks' balance sheet.

The final test we explore is the most direct test of our model of financial discipline. We test whether there appears to be a structural change over time in the correlation between bank lending and arrears.

We create a panel data set with all observations over the period 1992-1994 from the second sample. Two dummies are set to identify a possible break during the progressive monetary stabilization in 1994:

DUMMY = 1 for 1993 and 1994, zero else

DUMMY1 = 1 for 1994, zero else.

The first dummy measures the change in the average correlation coefficient between 1992 and the two following years; the second dummy measures the change in 1994. We then define four multiplicative dummies which test whether the coefficient on bank arrears and total arrears is significantly different in 1993 and 1994 than in 1992:

DBAR = DUMMY * STBA_EM .

DBAR1 = DUMMY1 * STBA_EM .

DTAR = DUMMY * (STBA_EM + IEA_EM)

DTAR1 = DUMMY1 * (STBA_EM + IEA_EM)

We run the regression on the compiled panel of all firms and all years, specifically to see whether the structural change dummies are significant and for what year. Once again the dependent variable is bank credit rescaled by employment, SBB_EM.

Table 9

Variable	B	SE B	Beta	T	Sig T
DBAR	2.705537**	.633865	.774450	4.268	.0000
DBAR1	-1.579169*	377173	.434528	-4.187	.0000
DTAR	-.193499*	.091685	-.107094	-2.110	.0351
DTAR1	.713928**	.144877	.312624	4.928	.0000
DUMMY	-25.725	14.826209	-.054059	-1.735	.0831
DUMMY1	-.229563	14.361068	-4.984E-04	-.016	.9873
IEA_EM	.123528*	.047291	.088082	2.612	.0092
PR_EM	-.157555*	.054461	-.097852	-2.893	.0039
SALES	2.003E-04*	2.0954E-05	.372332	9.562	.0000
STBA_EM	-.078176	.537057	-.022662	-.146	.8843
(Constant)	76.799488*	12.168049		6.312	.0000
Multiple R ²	.66631	R ²	.44397	Adjusted R ²	.43640
Standard Error	164.75282	F =	67.13096	Signif F =	.0000

Table 9 presents the results. The year dummies are not significant per se. However, the structural change dummies are very significant. It appears that the correlation between bank credit and bank arrears **strengthened** considerably in 1993, as more bank arrears lead to more than proportionally more bank credit. This results was **partially** reversed in the last year, which is somewhat reassuring. However, the second dummy reveals just the opposite. The sensitivity of bank lending to **aggregate arrears**, thus including trade arrears, is weaker in 1993 but it strengthens significantly in 1994.

Thus there is evidence that bank lending in more recent times has been increasingly responsive to total arrears, and that in 1994 there is a tactical switch from soft bank lending to cover bank arrears to soft bank lending to cover trade credit arrears. This is consistent with our previous interpretations. Overall, the results indicate that the correlation between bank lending and total arrears is

steadily deteriorating even in a time in which monetary stabilization presents an external image of greater financial discipline.

CONCLUSIONS

The conclusion of our investigation on the quality of credit allocation is that Romanian banks have continued to play a passive role, funding large and unprofitable state owned enterprises. Although there are some improvements in the allocation of credit among profitable SOEs, even in that subsample there is still a strong tendency for credit to be directed at larger firms and, most recently, to those with the most trade arrears. Among firms in the subset of the worse performing SOEs, the evidence suggests that the quality of credit allocation is deteriorating. At the same time there are signs that better firms are reducing their borrowing from the banking system, which is thus becoming a container of poor loans. There are also indications of a further shift of soft budget constraints away from trade credit and towards bank credit. The evidence is not consistent with the hypothesis that, as a result of a market oriented reform of the banking system, the allocation of bank credit in Romania is improving.

While most Romanian banks may not possess much expertise to undertake enterprise restructuring, on the other hand there are hardly any other institutions who may do so or have better expertise. Privatizing the banks, as Begg and Portes (1993) suggest, may help. However, changing the ownership of banks will not elude a basic problem: in many cases the expected value of a debtor's assets is less than the cost of enforcing bankruptcy. Thus, even privatized banks may find more attractive to wait for financial relief rather than start a liquidation process. Taking actions against creditors may signal that the bank has non-performing loans and it would cause a run on the bank. Under such ambiguous circumstances, banks would not be interested in initiating any liquidation procedures.

Foreign capital may provide the funds for recapitalizing Romanian banks. However, evidence that political pressures are at work in influencing the allocation of credit can only discourage foreign investors. At this stage the only alternative may seem to recapitalize the banks using Government funds. Unfortunately, this would send the wrong signal to lenders, just as the repeated bailout of trade credit did in 1990-1992, and presumably results in a continuation of the poor criteria for

lending. Only a sustained period of separation of financial and political decision-making may pave the way for a stable financial transition in Romania. Perhaps the decision by the Romanian government to subject a set of highly indebted firms to direct supervision and strict borrowing constraints should be seen as a first step in this direction.

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Appendix 1
Sample description

Variable	Mean	Count	Std Deviation
IEA_E91	14.48	345	174.69
IEA_E92	-44.68	345	246.82
IEA_E93	-1.44	345	130.72
IEA_E94	31.63	345	87.90
PR_EM92	21.13	345	72.80
PR_EM93	19.43	345	113.41
PR_EM94	5.32	345	189.44
SALES92	334904	345	516415
SALES93	209491	345	359232
SALES94	170937	345	348427
SBB_EM92	86.61	345	194.03
SBB_EM93	58.41	345	163.97
SBB_EM94	96.60	345	276.49
STBA_E91	6.77	345	24.30
STBA_E92	6.26	345	26.51
STBA_E93	4.10	345	30.12
BAR_EM94	17.89	345	101.52

Appendix 2
Subsample description
Bad enterprises

Variable	Count	Mean	Std Deviation
IEA_E92	63	2.68	111.36
IEA_E93	75	-9.11	113.69
IEA_E94	71	42.80	93.34
PR_EM92	63	-28.71	79.50
PR_EM93	75	-26.66	101.55
PR_EM94	71	-127.60	286.67
REC_E92	63	53.55	114.89
REC_E93	75	39.03	106.23
REC_E94	71	53.11	171.09
SALES92	63	163744	304446
SALES93	75	125837	219160
SALES94	71	70112	130207
SBB_EM92	63	90.84	201.36
SBB_EM93	75	42.15	123.40
SBB_EM94	71	183.30	463.73
STBA_E92	63	12.21	28.32
STBA_E93	75	10.56	49.88
BAR_EM94	71	51.52	192.25

Appendix 3
Subsample Description
Good Enterprises

Variable	Count	Mean	Std Deviation
IEA_E92	63	-89.31	388.06
IEA_E93	71	-2.15	210.81
IEA_E94	71	36.84	76.78
PR_EM92	63	93.54	84.16
PR_EM93	71	99.47	178.28
PR_EM94	71	130.11	171.81
REC_E92	63	189.11	432.29
REC_E93	71	104.08	241.86
REC_E94	71	97.10	151.18
SBB_EM92	63	141.84	292.67
SBB_EM93	71	63.48	170.61
SBB_EM94	71	87.03	209.53
STBA_E92	63	.49	1.57
STBA_E93	71	.47	2.00
BAR_EM94	71	.96	6.82