



BOFIT

Discussion Papers

2002 • No. 11

Antje Hildebrandt

Too many to fail? Inter-enterprise arrears in transition economies

Bank of Finland
Institute for Economies in Transition, BOFIT

BOFIT personnel 2002

Economists

Mr Pekka Sutela, head

Russian economy and economic policy
Russia's international economic relations
Baltic economies
Pekka.Sutela@bof.fi

Ms Tuuli Koivu, economist

Baltic economies
Tuuli.Koivu@bof.fi

Mr Tuomas Komulainen, economist

Russian financial system
Polish economy
Currency crises
Tuomas.Komulainen@bof.fi

Mr Iikka Korhonen, research supervisor

Baltic economies
Issues related to the EU enlargement
Iikka.Korhonen@bof.fi

Mr Vesa Korhonen, economist

Russia's international economic relation
Russia's banking system
Issues related to the EU enlargement
Vesa.Korhonen@bof.fi

Ms Seija Lainela, economist

Russian economy and economic policy
Seija.Lainela@bof.fi

Mr Jouko Rautava, economist

Russian economy and economic policy
Jouko.Rautava@bof.fi

Mr Jian-Guang Shen, economist

Chinese economy and economic policy
Financial crises
Jian-Guang.Shen@bof.fi

Ms Laura Solanko, economist

Russian regional issues
Public economics
Laura.Solanko@bof.fi

Ms Merja Tekoniemi, economist

Russian economy and economic policy
Merja.Tekoniemi@bof.fi

Information Services

Mr Timo Harell, editor

Press monitoring
Timo.Harell@bof.fi

Ms Liisa Mannila, department secretary

Department coordinator
Publications traffic
Liisa.Mannila@bof.fi

Ms Päivi Määttä, information specialist

Institute's library
Information services
Paivi.Maatta@bof.fi

Ms Tiina Saajasto, information specialist

Statistical analysis
Statistical data bases
Internet sites
Tiina.Saajasto@bof.fi

Ms Liisa Sipola, information specialist

Information retrieval
Institute's library and publications
Liisa.Sipola@bof.fi

Contact us

Bank of Finland
Institute for Economies in Transition, BOFIT
PO Box 160
FIN-00101 Helsinki

Phone: +358 9 183 2268

Fax: +358 9 183 2294

E-mail: bofit@bof.fi

Internet: www.bof.fi/bofit

BOFIT

Discussion Papers

2002 • No. 11

Antje Hildebrandt

Too many to fail? Inter-enterprise arrears in transition economies

Bank of Finland
Institute for Economies in Transition, BOFIT

BOFIT Discussion Papers
Editor-in-Chief Ilkka Korhonen

BOFIT Discussion Papers 11/2002

Antje Hildebrand:

Too many to fail? Inter-Enterprise Arrears in transition economies

ISBN 951- 686 - 838 - X (print)
ISSN 1456-4564 (print)

ISBN 951- 686 - 839 - 8 (online)
ISSN 1456-5889 (online)

Contents

Contents	i
Tiivistelmä.....	iii
Abstract	1
1 Introduction.....	2
2 Trade credits and soft budget constraints.....	4
3 The survey data	9
4 An empirical snapshot	10
5 Discussion of the results	12
6 Conclusion and policy implications.....	17
References	19
Tables.....	24

All opinions expressed are those of the author and do not necessarily reflect the views of the Bank of Finland.

Antje Hildebrandt

Too many to fail? Inter-enterprise arrears in transition economies

Tiivistelmä

Kehittyneissä markkinatalousmaissa kauppaluottoja käytetään yleisesti yritysten välillä lyhytaikaisessa rahoituksessa. Joissakin siirtymätalouksissa yritysten välisiä luottoja on kuitenkin kertynyt niin paljon, että ne ovat johtaneet keskinäisiin maksurästeihin. Tässä tutkimuksessa selvitetään yritysdatan avulla, ovatko kauppaluotot osa normaalia liikekäytäntöä vai edustavatko ne pehmeän budjettirajoitteen muotoa. Tulokset antavat aiheen olettaa, että joissain siirtymätalouksissa kauppaluotot eivät aina ole samalla tavalla osa normaalia liikekäytäntöä kuin kehittyneissä markkinatalousmaissa. Tämä ongelma on ollut suurin niissä siirtymätalouksissa, jotka eivät ole uudistaneet talouttaan johdonmukaisesti.

Asiasanat: siirtymätaloudet, maksurästtit, pehmeä budjettirajoite

Too Many to Fail? Inter-Enterprise Arrears in Transition Economies

Antje Hildebrandt*
antje.hildebrandt@wiwi.hu-berlin.de

September 23, 2002

Abstract

In advanced market economies, the use of trade credits is an important way of short-term financing and considered as being part of normal business practice. Some transition economies, however, have experienced a rapid accumulation of trade credits which have led to interlocking webs of arrears and collective bail outs by the government. In this paper, firm-level data is used to test whether trade credits represent part of normal business practice comparable to advanced market economies or whether trade credits are representing a systematic phenomenon supporting soft budget constraints. The results suggest that trade credits are not just normal business practice but that they can have negative spill-over effects on other firms by worsening their financial situation. We conclude that the problem of interlocking effects is more pronounced in countries which are less committed to economic reforms. Some countries have made steady progress in economic development while others have lost their momentum and suffer from marked macroeconomic imbalances and weak institutions.

Keywords: transition economies, inter-enterprise arrears, soft budget constraints

JEL-classification: P31, P35, L10

*This paper was mainly written while I was a visiting researcher at the Bank of Finland's Institute for Economies in Transition (BOFIT) and I am especially grateful for the perfect working environment. I thank the participants at the BOFIT seminar for comments and suggestions I also would like to thank LICOS (Centre for Economies in Transition) at the K.U. Leuven/Belgium for providing the data.

1 Introduction

In advanced market economies, non-financial firms frequently bundle the supply of capital with the supply of goods by granting trade credits to their customers. Such trade credits, voluntarily granted and paid back in due time, are considered part of normal business practice. In many transition countries, in contrast, trade credits, and more specifically overdue trade credits (inter-enterprise arrears), have emerged as a serious policy issue. At the start of transition, inter-enterprise arrears accumulated so rapidly as to threaten viable firms with spill-over effects. Some governments responded with bailouts of indebted firms to prevent cascading enterprise failures.

The aim of this paper is to assess whether inter-enterprise arrears are still an obstacle for economies in transition by strongly linking firms via payables and receivables which might eventually result into an interlocking web of arrears. Applying a simple empirical framework, we assess the reasons a firm might get into arrears. For this purpose, we use survey data of Hungarian and Romanian firms to test for country heterogeneity. The resulting empirical snapshot suggests that trade linkages among Romanian firms continue to pose a substantial danger of creating chains of arrears, while this is no longer the case in Hungary. Apparently, some transition countries handled the arrears problem better than others. Possible explanations are the level of institutional development such as working bankruptcy procedures and financial intermediation, and, as an essential factor, government commitment to market reform.

This paper draws mainly on two bodies of literature. We look first to the discussion of trade credits in advanced market economies to understand the reasons for their extensive use in the presence of a functioning banking sector and their relation to development of financial institutions (e.g. Petersen and Rajan, 1997; Demirgüç-Kunt and Maksimovic, 2001). The second relevant discussion concerns the role of trade credits in relation to the problem of soft budget constraints (SBCs) in transition economies. As shown by Berglöf and Roland (1998) and Perotti (1998), strong one-to-one trade linkages of firms increase the likelihood of government bailouts. Perotti (1998) notes the tendency to collusion among firms when a stabilisation programme lacks credibility, i.e. anticipating a collective bailout, firms have incentive to grant trade credits they know will not be paid back.

We further refer to papers that provide evidence of national arrears crises

(e.g. Clifton and Khan, 1993; Daianu, 1994; Ickes and Ryterman, 1992 and 1993; Rostowski, 1994), as well as to empirical papers on testing for the determinants of inter-enterprise arrears in transition economies. Johnson et al. (1999) use survey data to explain the importance of trust in the decision to grant trade credits. Trust is determined both by formal and informal rules. Frydman et al. (2000) use a probit model to test for the probability of default on obligations to different types of creditors depending on, among other variables, ownership structure. A paper by Calvo and Coricelli (1994) is particularly relevant for our approach as they empirically test for chains of arrears in Romania using data for state-owned firms in 1992, a time immediately following a general bailout when companies expected further relief. Our empirical snapshot differs from that of Calvo and Coricelli (1994) in three crucial respects. First, our more recent survey data is less distorted by the bailout. Second, our sample is more representative as we include firms with various types of owners (i.e. not just state-owned companies). This allows us to test whether certain types of owners are more prone to accumulate arrears and whether inter-enterprise arrears are a widespread phenomenon in a particular country. Additionally, our data set allows us to compare two countries in transition, Hungary and Romania. They have distinctly different transition experiences, making comparison valuable.

Our results provide striking evidence of the “Great Divide”, noted by Berglöf and Bolton (2002), that separates central and eastern European countries (CEECs) today. Some CEECs, including Hungary, continue to make steady progress in economic development, while others such as Romania have lost their economic momentum and suffer from marked macroeconomic imbalances and weak institutions.

The paper is structured as follows. In Section 2, the reasons for the extensive use of trade credits in advanced market economies and transition economies are described. The discussion then focuses on the linkages between trade credits and the problem of soft budget constraints. For illustrative reasons, Romania’s general bailout is described. Section 3 specifies the data used for the empirical snapshot in Section 4 where we test for the existence of chains of arrears. The results are discussed in Section 5. Section 6 concludes.

2 Trade credits and soft budget constraints

In advanced market economies, non-financial firms routinely act as financial intermediaries by voluntarily granting trade credit to their customers. The use of trade credits allows the exchange of goods and services to be separated in time and place from the simultaneous exchange of money. This is a fundamental form of short-term external financing in market economies and perhaps the most important source of finance in the United States (Jaffee and Stiglitz, 1990). In Germany, France and Italy, trade credits constitute over a quarter of total corporate assets (Demirgüç-Kunt and Maksimovic, 2001).

Several explanations for the extensive use of trade credits in advanced market economies have been put forward. One strand of theories emphasises the advantages suppliers likely have over financial institutions in running credit checks on their trading partners and in monitoring outstanding trade credits. Suppliers may well consider themselves to be in a superior position to financial institutions both in acquiring information on their customers' creditworthiness through their normal business connections and in controlling and sanctioning a customer's default on debt (e.g. stopping further deliveries). The use of trade credits may also allow suppliers to price discriminate where certain pricing policies are otherwise prohibited by law. Moreover, the provision of trade credits may reduce transaction costs, e.g. by combining invoices, setting payment schedules or rationalising organisation of inventories (Petersen and Rajan, 1997). A supplying firm may even be willing to provide its trading partners with trade credits in situations where financial institutions would have otherwise turned down the trading partner. Here, it is efficient for the supplier to borrow from banks, while providing trade credits to customers. The use of trade credits should therefore be positively correlated with bank lending implying that trade credits depend on the efficiencies of the banking sector of a country. Demirgüç-Kunt and Maksimovic (2001) provide empirical evidence for this view, demonstrating that informal credit arrangements between firms complement development of the banking sector.¹ Overall, the use of trade credits generally leads to an efficient channeling of short-term capital to their greatest use, even where a financial sector specialised in providing capital exists.

A strikingly different situation arose at the start of transition, when many

¹Jain (2001) shows theoretically that trade creditors do not compete with banks.

CEECs had to confront explosions in the use of trade credits and trade arrears. Various explanations of the rapid accumulation of trade credits in these transition countries have been suggested. The most widely accepted causes are the credit crunches enterprises faced after stabilisation programmes with tight fiscal policies were implemented (e.g. Calvo and Coricelli, 1994) and the lack of financial discipline of firms in transition (e.g. Rostowski, 1994). Under these arguments, trade credits are a peculiar form of credit provided involuntarily to trading partners without an expectation of repayment. In fact, trade credits and trade arrears in CEECs are sometimes considered as part of normal business practice as in advanced market economies. These arguments assume that firms have learned to assert their claims using credit control mechanisms (Schaffer, 1998). Under such assumptions, inter-enterprise arrears do not represent a serious threat to the economy. A further approach regards the explosive increase of trade credits and inter-enterprise arrears as part of an adjustment from centrally planned economies, where the use of inter-enterprise credits was generally forbidden,² to levels comparable to Western market economies (Begg and Portes, 1993b).

However, CEEC experiences clearly show that inter-enterprise arrears can rapidly accumulate to form an interlocking web of arrears. The consequent congestion of the payment system from non-payment of bills puts suppliers in financial distress because they cannot pay their own bills. As shown by Berglöf and Roland (1998), the interlocking nature of inter-enterprise arrears can raise the problem of soft budget constraints (SBCs).³ They analyse SBCs as a dynamic commitment problem in the presence of irreversible investments and allow for the possibility of spill-over effects due to trade linkages. It is assumed that the return from a good project decreases with the number of liquidated projects so a government or bank faces the potentially extremely costly situation where liquidation of bad firms reduces the pay-off of good firms. The government or (state-owned) bank is therefore inclined to rescue bad firms to prevent harm to good firms. These spill-over effects, due to strong one-to-one relations between suppliers and buyers, may induce SBCs. Thus, trade credits become a prolongation of SBCs backed by an awareness that chains of arrears or an interlocking web of arrears will likely lead to a government bailout. Therefore, while individual firms are not “too big to

²Notable exceptions were found, e.g. in Hungary (Buch, 1996).

³Kornai's (1979, 1980) seminal work on soft budget constraints refers to a situation where a loss-making firm is bailed out to guarantee its survival.

fail,” they can, in aggregate, be “too many to fail.”⁴ Perotti (1998) shows theoretically that enterprises might collusively accumulate trade credits when they expect to be bailed out by a government that wants to avoid a pull-down of good firms chain-linked to bad firms. Thus, suppliers strategically extend credits to their customers knowing it is unlikely the credits will ever be paid back.

The Romanian experience provides a highly illustrative example of collusive behaviour among firms. With the launch of economic reforms in the early 1990s, Romania experienced a drastic acceleration of inter-enterprise arrears. Enterprises feared damaging effects from the blockage of the payment system which they saw as responsible for the fall in output,⁵ and pressured the government to deal with the problem.⁶ At the end of 1991,⁷ after the failure of various attempts to reduce arrears, the government instituted a general bailout described as a “global compensation” plan to wipe away nearly all inter-enterprise arrears.⁸ Such financial relief did little to solve the problem. Ahead of the government’s action, inter-enterprise arrears rose on the near-certainty of an impending bailout. Moreover, as discussed by Perotti (1998), moral hazard problems were worsened because the government was unable to credibly convince firms the bailout would not continue. Despite passing a new law on enterprise financial discipline⁹ and public announcements that there would be no further bailouts, firms continued to bet on further rescue efforts (Clifton and Khan, 1993; Perotti, 1998) and inter-enterprise arrears

⁴Mitchell (1998) uses the term “too many to fail” to describe the situation where it is more costly to close a large number of banks than bail them out.

⁵Real GDP decreased by 5.6% in 1990 and 12.9% in 1991 (EBRD, 2001).

⁶Inflation sharply increased – partly because of rising inter-enterprise arrears – which also drove the need to find a quick solution to the arrears crisis (Clifton and Khan, 1993).

⁷Inter-enterprise arrears reached about 50% of GDP (Clifton and Khan, 1993).

⁸In practice, the government asked all firms to list their arrears with other firms or the state. Banks gave credits with government guarantee and eventually cleared the backlog of arrears (Clifton and Khan, 1993).

⁹The law on financial discipline (Law 76) spells out the following measures:

“*Article 9:* Economic agents with overdue payments obligations that remain unsettled for more than 30 calendar days after the due date shall be considered insolvent. Payments insolvency must be communicated to the debtor by any creditors, including the state, after the period of 30 days has expired.

Article 10: Following a court decision confirming insolvency, creditors can take action to liquidate unsettled claims of their debtors. Economic agents having unsettled claims shall be sued and subjected to compulsory payment or a forced sale of their assets in the following order: monetary means, including deposits in banks; inventories of raw materials and finished products; claims and fixed assets; and other estate items.

Article 12: The list of economic agents declared insolvent shall be made public.” (Clifton and Khan, 1993).

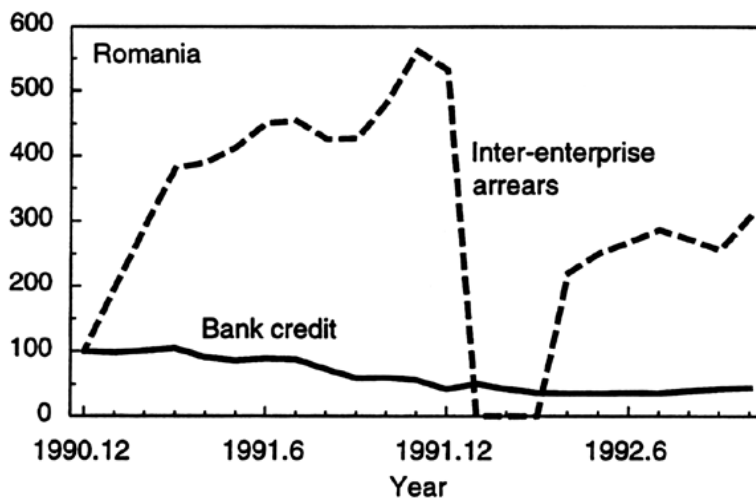


Figure 1: Development of bank credits and inter-enterprise arrears/credits in Romania 1990-1992, deflated by producer price indices, starting date figure =100 (from Calvo and Coricelli, 1994)

increased after implementation of the global compensation scheme (Figure 1).

The accumulation of inter-enterprise arrears can jeopardise reform efforts because the lack of financial discipline encourages inefficient allocation of resources. Managers have no incentive to restructure or submit to economic demands. Distortion also arises as nonviable firms are sustained and the normal exit of firms – a driving force for the reallocation of resources to productive firms – is suspended. It becomes difficult for outsiders to differentiate between good (economically viable) and bad firms due to uncertain liquidation values, which complicates the implementation of bankruptcies (Begg and Portes, 1993a; Perotti, 1999).¹⁰

The accumulation of inter-enterprise arrears can also cause inflation. Monetary control can be defeated by firms that circumvent a tight credit market by creating their own liquidity through trade credits (e.g. Daianu, 1994). By gaining liquidity, firms do not feel compelled to rein in prices and wages or otherwise adjust to market conditions. This fuels inflationary pressure and undermines attempts by monetary and fiscal authorities to stabilise the economy (IMF, 2001; OECD, 2002).

The main objective of our empirical testing is to analyse whether nega-

¹⁰Ickes and Ryterman (1993a) discuss in detail the importance of good enterprise-level information for imposing hard budget constraints.

tive spill-over effects that might eventually set off chains of arrears can be identified in the data. As predicted in the theoretical literature, we expect interlinkages between firms to increase the likelihood of SBCs. In the regression, we include several other variables that might influence a firm's arrears.

The number of employees, as a measure of firm size, is included. Firm size can then be linked with overdue trade credits in either of two ways. First, assuming a paternalistic governmental attitude accounts for a lack of financial discipline (Kornai, 1979, 1980), we might expect firms with large number of employees to be more prone to run into arrears. The government wants to maximise employment or output, so large enterprises feel less threatened by bankruptcy than small firms. Thus, the size of a firm would have a positive effect on overdue payables. Conversely, firm size could have a negative influence on arrears. According to the literature on trade credits, larger firms have better access to bank credits than smaller firms. They are regarded as more creditworthy because they are older and better established and, therefore, less constrained by liquidity. This, in turn, makes them less dependent on the use of trade credits than small firms (Petersen and Rajan, 1997; Nilsen, 2002), i.e. big firms might be in a better position to pay their bills on time.

Ownership variables are included to test whether certain owners are more likely to accumulate overdue debts. In line with the theoretical work of Dewatripont and Maskin (1995), we predict state-owned firms are less likely to comply with financial discipline.¹¹

Obviously, the financial situation of a firm is a decisive factor in a firm's ability to pay on time. In transition economies, Carlin et al. (2000) find a strong positive correlation between barter, which has similar functions as trade credits, and financial problems of firms. Overall, firms in financial distress might be less able to meet their liabilities in due time than healthy firms. Thus, we control for the general financial situation of firms in the regression analyses.

Daianu (1994) argues that the degree of outward orientation of a firm can be crucial for avoiding chain links between firms. If a firm exports to foreign markets with liquid customers that follow prudent business practices, it may escape the network trap of inter-enterprise arrears within the country. Therefore a variable reflecting outward-orientation of a firm is included.

¹¹Again, it can be argued that state-owned firms have better access to bank financing and thus are less likely to use (over-) extended credit periods.

3 The survey data

The data used to test the aforementioned hypotheses is based on a detailed survey of several transition economies conducted at the end of 1996 and beginning of 1997 by LICOS (Centre for Transition Economies, K.U. Leuven, Belgium) under the framework of the Phare-Ace network's "Understanding Enterprises in Transition". Firms were surveyed in several CEECs, including 123 in Hungary and 126 in Romania. The present study is based on a sub-sample of this original data set and excludes firms with incomplete information. Hungary and Romania were chosen because of their differences: Hungary is among the most advanced CEECs, while Romania lags most CEECs in its economic progress.¹² The choice of these two permits us to test for country differences that explain the accumulation of debts. Descriptive statistics are presented in Table 1 in the appendix.

In the survey, firms were asked about the structure and maturities of their liabilities and receivables. The data set not only includes to whom the receivables are owed and to whom the liabilities have to be paid, but also whether they are overdue. To test the hypothesis that inter-enterprise arrears induce negative spill-over effects, the survey provides a basis for creating dummies indicating whether a firm has outstanding receivables and overdue liabilities. In both countries, most overdue payables of firms are owed to other firms. Firms are less likely to default to banks or the government. A similar picture arises for overdue receivables: firms, rather than households, banks and the state administration,¹³ are more likely to default on their payment obligations.

Pursuing our hypothesis that the size of a firm affects the willingness or ability to comply with financial obligations, we include the number of employees in the regressions. The average Romanian firm is quite large compared to firms in Hungary. This reflects the fact that the Romanian economy was, and still is, more centralised with its huge conglomerates intact.

The ownership structure of firms also varies between the two countries. In Romania, the privatisation process is less advanced than in Hungary, where

¹²The European Commission's latest "Report on the progress of candidate countries towards meeting the economic criteria for accession" (2001), rates Hungary as a functioning market economy that should be able to cope with the competitive pressure and market forces within the EU. Romania, in contrast, does not yet meet the economic criteria for membership. The differences in per capita income were quite large. In 1999, GDP per capita was \$4,775 in Hungary and \$1,512 in Romania (EBRD, 2001).

¹³"Receivables from state administration" includes subsidies and grants.

most state-owned companies are already privatised. We create dummies that indicate whether a firm is state-owned, privatised¹⁴ or *de novo*. The last type, which is the omitted variable in the regressions, is defined as a firm that since its establishment is 100% privately owned and founded after January 1, 1990.

As mentioned, the overall financial situation can be a decisive factor for the accumulation of payables. Thus, a variable accounting for the ability to pay is considered. Firms were asked if they have experienced financial difficulties since 1989 and in which year. We were able to construct dummies indicating different degrees of financial distress. Admittedly, using a measure of the financial situation of a firm based on a managerial evaluation rather than financial statements (e.g. balance sheet, profit/loss or cash flow) may be controversial. However, we believe a managerial assessment gives a good overall picture of the liquidity constraints the firm faced. Furthermore, complete information e.g. about sales and profit/loss is often unavailable.

To test whether firms are able to avoid networks of arrears in domestic markets by exporting their products, we used a dummy that reflects the export-orientation of a firm. We define a firm as export-oriented when at least 50% of its products are sold abroad. In Hungary, 24% of all sample firms exported more than 50% of their products. In Romania, only 9% of the surveyed firms were strongly export-oriented.¹⁵

4 An empirical snapshot

Our empirical testing provides a snapshot of the two economies. Our main question is whether firms are more likely to have overdue liabilities because of their overdue receivables. In the first regressions (Tables 2 and 3 in columns 1 and 2), we test for the likelihood that a firm has defaulted on any of its outstanding debts. In doing so, we infer a difference between the accumulation of any arrears a firm has and its inter-enterprise arrears. The dependent variable equals 1 if the firm has outstanding debts¹⁶ and zero otherwise. Due to the discrete dependent variable, we use a logit model. The results for Hungary are presented in Table 2 and for Romania in Table 3. To identify

¹⁴The category “privatised firms” includes enterprises owned by insiders.

¹⁵The view that Hungary is more outward-oriented than Romania is further evidenced by its share of trade in GDP defined as the ratio of exports plus imports over GDP. In 1997, the share of trade in GDP was 90.2% for Hungary and 53.9% for Romania (EBRD, 2001).

¹⁶This includes outstanding debts to other firms, to the bank and to the budget.

chains of arrears, a dummy for outstanding receivables from trading partners, banks, households and the budget is included. We control for further factors that might increase the likelihood of a firm running into arrears. As argued above, firm size, ownership structure and the firm's overall financial situation may influence its ability or willingness to meet its financial obligations. In addition, a dummy representing the export-orientation of the firm is included, because firms that can escape the network of arrears by exporting to other markets may be in a healthier position and do better job of paying their bills on time.

In Hungary, arrears appear to be largely determined by the firm's financial difficulties. Overdue receivables, as well as ownership structure and export orientation have no significant effect on firm arrears. For logit models, the estimated coefficients do not necessarily have a direct economic interpretation (Greene, 1997). Thus, to get an estimate of the magnitude of the impact of a particular variable, marginal effects are calculated. Positive coefficients indicate an increase in the probability that the firm has to report overdue liabilities. For Hungary, the probability is highest for the variable representing financial difficulties. If the variable changes from 0 (no financial difficulties for three or more years) to 1 (financial difficulties for at least three years), the probability that a firm has overdue liabilities increases about 35%.¹⁷ In the second regression of Tables 2, ownership variables and a variable for export-orientation of a firm are added. The results of the first regression remain largely unchanged. Although overdue receivables and the variable for state ownership are not significant, marginal effects have a value of around 20% (positive in the first case and negative in the latter).

The results for Romania differ strongly from the Hungarian results. As indicated in Table 3, overdue liabilities of a firm are strongly explained by overdue receivables; the marginal effect amounts to 25% whereas financial difficulties a firm faces are not decisive for having overdue liabilities. As can be inferred from the second regression of Table 3, state ownership seems to have a significant effect on overdue liabilities of a firm (with a marginal effect of 24%). The probability for having overdue liabilities subject to having overdue receivables increases to 31%.

In both countries, employment has no effect on the likelihood of a firm running into arrears. This is also true for export orientation, although the

¹⁷We considered different degrees of financial difficulty, but basically they did not affect our results.

negative sign implies that an increase in exports reduces the likelihood of arrears.

Regressions 3 and 4 in both tables present an estimation of the likelihood of a firm's default on obligations to trading partners as a function of its outstanding receivables from trade with other firms. The results are largely the same. In the case of Romania, the idea of interlinkages between firms is stronger: the marginal effect rises to over 70% when enterprise transactions are considered alone.

5 Discussion of the results

The empirical results should be taken as a snapshot of the two economies. We address the stock – not the flow – of arrears. No time series are used. Moreover, due to the data limitations, we could not include variables with possible explanatory value such as industry-specific characteristics and accessibility to bank financing. Despite this, the results are revealing and provide strong evidence of that chains of arrears existed in the Romanian economy even after more than seven years of transition. Considering the development of inter-enterprise arrears in recent years (see Figure 2 below), chains of arrears probably continue to present a systematic risk for the country. In the Hungarian sample, as in Western market countries, a firm's overdue liabilities were generally determined by its financial situation, indicating that chains of arrears have been largely broken up. Firms which are more constrained by liquidity or which lack easy access to bank finance rely more heavily on trade credits (Petersen and Rajan, 1997). This suggests firms in Hungary have already moved to more market-oriented conditions and practices. In the case of Romania, the ownership structure of firms also influenced the likelihood that a firm will run into arrears. State-owned and certain privately-owned firms were more likely to run into arrears.

Why would a country allow itself to stumble into an interlocking web of arrears? As already pointed out, a multitude of causes have been put forward to explain this undesirable outcome. Early in the transition process, a surge of trade credits is mainly seen as a natural response to the credit crunch that firms faced after the launch of tight credit policies to keep inflation under control and force firms to comply with financial discipline.¹⁸ Thus,

¹⁸Using macroeconomic data for Russia, Kim et al. (2001) found out that the lack of restructuring and low liquidity of firms have a positive influence on barter comparable to

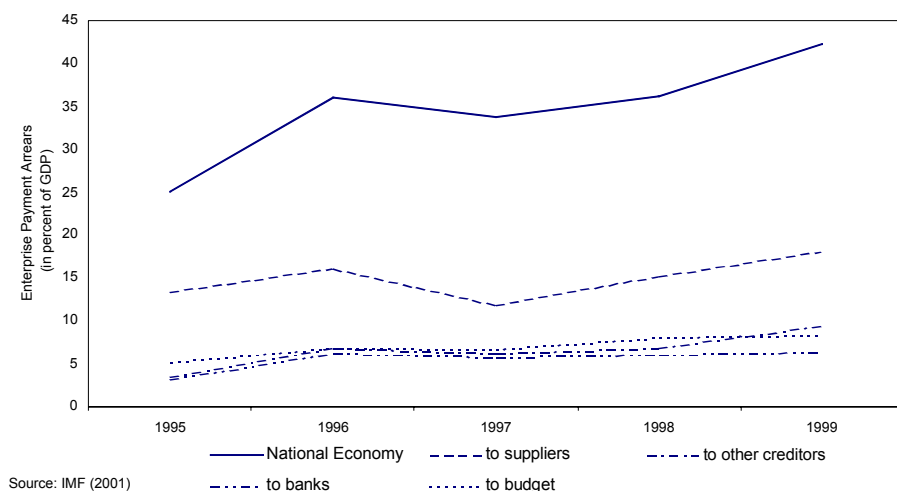


Figure 2: Development of enterprise payment arrears in Romania, 1995-1999

firms had to rely on other financial sources, i.e. trade credits, to escape the liquidity squeeze (Calvo and Coricelli, 1994; Perotti, 1999; Commander and Mummsen, 2000). After the implementation of stabilisation programmes in CEECs, most experience a sharp increase in trade arrears. Some governments, such as Hungary's, staunchly resisted bailing out firms,¹⁹ while others undertook massive rescue operations. Berglöf and Bolton (2002) argue that these divergent policies at the start of transition already opened up the "Great Divide" in economic and financial development of CEECs. The evolution of trade credits, as well as overdue trade credits, merely illustrates broader differences among CEECs in making the move to market-oriented economies. While the trade-credits-in-arrears situation has yet to stabilise in Romania, the situation in Hungary is quite stable (Kornai, 2001). Indeed, one can observe a sharp increase in enterprise payment arrears in Romania (see Figure 2), which supports the hypothesis that trade arrears are continue to be a severe problem for the economy as also pointed out by the IMF (2001) and the OECD (2002).

What determines whether an economy falls into an arrears crisis or quickly adjusts to a more market-oriented behaviour? Why is the outcome in Roma-
trade credits.

¹⁹Although many Hungarian firms found themselves "waiting in line" for payments in the early 1990s. This is the freeze-up of the payments system where creditors cannot pay their bills because they have outstanding receivables from their own customers (Mitchell, 1993).

nia so different from more advanced transition countries such as Hungary? What determines collusive behaviour of firms?

Romania notably failed to establish such market-supporting institutions as working bankruptcy procedures. Bankruptcy laws and their consistent enforcement^{20,21} are essential in market economies because they force the precise defining of property rights and the exit from the market of unprofitable firms in order to free up resources for productive use. Perhaps most importantly, the threat of bankruptcy imposes financial discipline on the debtor (Mitchell, 1993). Which is to say that firms not threatened by sanctions feel no obligation to meet their financial commitments as the threatened costs and sanctions are minor. The Romanian government failed to signal its strong commitment to imposing financial discipline on firms, finding it politically and socially expedient to allow the continuation of economically nonviable firms. Additionally, the combination of long-term historical ties between firms combined with the assurance of government support induces firms to grant credit to uncreditworthy customers. This collusive outcome is further supported by the lack of alternative markets with liquid customers (Perotti, 1999).

A very different picture emerges in Hungary. The rapid increase of enterprise arrears in the early 1990s was a decisive factor in the implementation of a tough bankruptcy law in 1992. The law contained an “automatic triggering” clause, whereby managers were required to file for reorganisation or liquidation within eight days when they had arrears exceeding ninety days (Gray et al., 1996).²² The Ministry of Finance adamantly rejected political calls for a bailout of enterprises, seeking instead to prevent the softening of budget constraints and enforce financial discipline (Mizsei, 1994). In such an environment, characterised by a credible commitment to economic reforms, firms quickly adopted market rules and learned to deal with overdue credits (e.g. by stopping deliveries to customers, requiring advance payment or denying credit). Chains of mutual debt among enterprises were rapidly broken up. Trade creditors were soon aggressive in forcing firms to comply

²⁰Especially in transition countries, political constraints such as vested interests of officials in preventing closure of firms, are often an obstacle to implementing bankruptcies effectively (Mitchell, 1993).

²¹Inefficiencies with bankruptcy proceedings can also be caused by a lack of aggressiveness on the part of creditors in insisting on repayment (Mitchell, 1993).

²²The “automatic triggering” clause helped precipitate a massive wave of corporate failures that overwhelmed Hungary’s bankruptcy courts. At the end of 1993, the government moved to eliminate the “automatic triggering” clause (Burniaux, 1995).

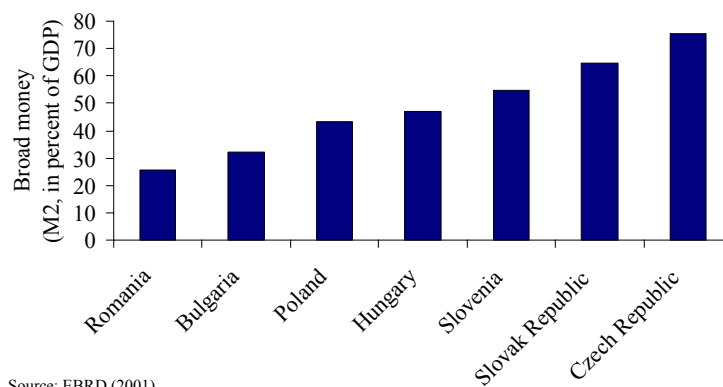


Figure 3: Degree of monetisation of transition economies (1999)

with their financial obligations (Mitchell, 1993). As Schaffer (1998) notes, trade arrears for Hungarians are generally treated as part of normal business practice as in advanced market economies.

Low financial intermediation is often blamed for mounting overdue trade credits. Well-functioning financial markets are necessary to provide liquidity to creditworthy firms. With alternate financial sources unavailable, firms use trade credits more likely to avoid a liquidity squeeze. In Figures 3 and 4, two standard measures are given: national financial development reflected in broad money and credit to the private sector as a percentage of GDP. Financial intermediation is low in all transition countries, but, as shown, it is particularly low in Romania.²³ Without alternative sources of financing or high opportunity costs for bank lending in comparison to the use of trade credits,²⁴ firms are prone to rely on trade credits.

However, as noted by Berglöf and Bolton (2002), underdeveloped financial markets are largely an outcome of institutional backwardness and can be linked to progress in introducing market reforms. An environment characterised by macroeconomic imbalances, unenforceable contracts, soft budget constraints on firms and banks, and an overall weak trust in the domestic

²³In contrast, credit to the private sector as a percentage of GDP is much higher in western market economies, in 1996, e.g., 154% (USA) and 104.9% (Germany). The same is the case for M2/GDP. In 1996, this measure amounts to 59% in the USA and 62% in Germany (World Bank, 1998).

²⁴The price of trade credits in advanced market economies, in contrast, is generally high because firms lose their early payment discount. This corresponds to an annual interest rate over 24% (Jaffee and Stiglitz, 1990). In such cases, trade credit finance could be regarded as a less preferable alternative to bank lending.

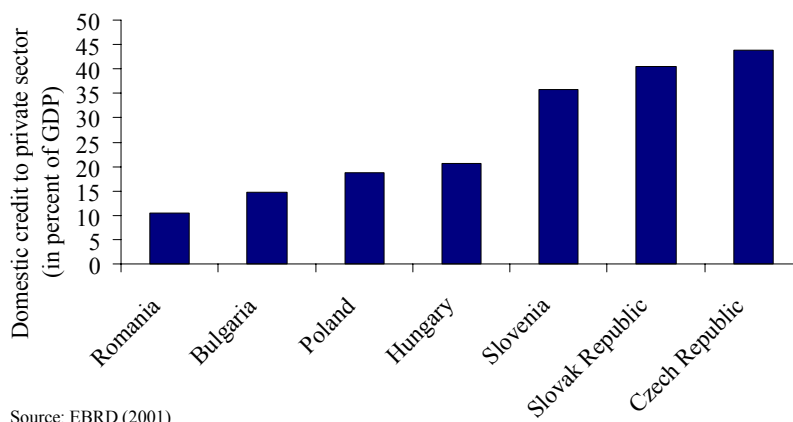


Figure 4: Credit to the private sector (1999)

economy, undermines financial sector development.

A further factor complicates the establishment of a working banking sector in transition economies. Banks often face problems assessing the financial viability of a firm because information systems are undeveloped and fail to pool basic credit information.²⁵ An interlocking web of arrears makes it almost impossible to distinguish between “good” and “bad” firms, i.e. evaluate creditworthiness (Perotti, 1999). Banks thus may prefer lending to state-owned firms they have known for years rather than new firms. Linkages between state-owned firms and banks, which are also frequently state-owned,²⁶ may prevent credit from being allocated efficiently. Moreover, privatisation is harder if firms are burdened with arrears of payments (Begg and Portes, 1993b).

Although it is generally agreed that the development of the financial system can have positive effects on economic growth (see e.g. King and Levine, 1993a and 1993b) and that financial markets are necessary for effective restructuring and hardening of budget constraints of firms (see e.g. Ickes and Ryterman, 1993b), a basic institutional framework needs to exist to promote the evolution of capital markets. This raises a fundamental follow-up question: Why did some CEEC governments managed to resist bailouts and vested interests better than other countries?

²⁵This is true even in advanced transition countries such as the Czech Republic (Business Central Europe, 2000)

²⁶In 2000, Hungary’s state-owned banks held 8.6% of total assets, while in Romania, state-owned banks controlled 50% of total assets (EBRD, 2001).

Failure to move quickly to a market-oriented economy could partly account for a certain degree of economic backwardness. All transition countries inherited economic distortions from the planned economy, but there was a large variation in starting points when they began to move towards a market economy. De Melo et al. (1997) observes that the Romanian economy was in much poorer shape than Hungary's with regard to macroeconomic distortions, development and over-industrialisation. Due to Romania's more substantial misallocation of resources, the social and economic costs of reforms (e.g. large layoffs without alternative job prospects) were probably much larger than for countries such as Hungary. Transition reforms in Romania were so onerous that they threatened to provoke a public backlash, and consequently weakened political support for reforms (Daianu, 1999).²⁷ Political constraints seem to have been decisive in preventing Romania from embracing reform.

Favorable geographical conditions, such as the proximity to the Western markets, may also play a role in encouraging the move to a market economy (Perotti, 1999). The prospect of EU membership has had strong leverage effects on reforms by acting as an "outside anchor" that discourages inertia and reform backsliding. Indeed, it has even spurred economic reform in some cases (Berglöf and Roland, 1997; Fischer and Sahay, 2000). Hungary is currently a front-runner among EU accession candidates, while Romania trails at the rear of the pack.²⁸

6 Conclusion and policy implications

Using a simple empirical framework, we tested for the presence of chains of arrears in two transition economies, Hungary and Romania. Our results suggest that, while strong trade linkages had been broken up in Hungary, this was not the case for Romania. Assumably, trade credits still represent a systemic risk to the Romanian economy. Country experiences show that the problem of arrears is closely linked with the ability to adjust to structural

²⁷This was seen in the last election. In 1997, a reformist centre-right coalition came into power and introduced major reforms based on "shock therapy." These costly reforms failed to prevent a drastic decline in industrial output and did not reduce inflation as much as hoped. Parliamentary and presidential elections in 2000 returned a less reform-oriented, social democratic government to power (Pop-Eleches and Pop-Eleches, 2001).

²⁸As of July 2002, Hungary had closed 26 of 31 chapters in the *acquis communautaire*, the basis of accession negotiations between the EU and candidate countries. At that time, Romania had closed 13 chapters (European Commission, 2002).

changes, as well as the credibility of the national stabilisation programme early in transition and institutional development in the long run. After a decade of transition in central and eastern Europe, it is clear that building market-oriented institutions and changing government perceptions is a complex, time-consuming challenge.

What should a government do in the short run if it faces a large stock and flow of inter-enterprise arrears and its economy is susceptible to a chain of arrears? There are two extreme positions. The first, as e.g. proposed by Schaffer (2000), is to do nothing. The alternative is to implement a general bailout of firms in arrears. Both strategies carry severe consequences. The first strategy is advisable only if firms already apply basic credit mechanisms and no interlocking webs of arrears have yet formed. The negative spill-over effects generated by this approach can put viable firms at risk. The second strategy solves the stock problem of arrears in the short-term, but gives rise to serious moral hazard problems. Further, a stringent liquidation of firms in arrears is difficult to enforce because the state lacks information to distinguish between good and bad firms. In the short-run, the government should, in principle, signal its commitment to economic reforms by liquidating inefficient firms. Indeed, Stiglitz (1994, p. 238) argues this is “perhaps the most important commitment.” In Romania’s case, however, such a commitment would have extended mainly to state-run utility companies because they were the biggest actors in accumulating enterprise arrears (Santarossa, 2001; OECD, 2002). Rather than setting a good example, the state itself may be reluctant to follow basic market economy principles.

For less advanced CEECs to cross the “Great Divide” and escape the transition trap, they should focus on building up market-supporting institutions and work to improve confidence in government policies and competitive markets. The state is still overinvolved in the Romanian economy which impedes market-based adjustments such as private sector development (OECD, 2002). The inflow of foreign direct investments should be promoted as a way to impose market-oriented practices and infuse liquidity into the country. Of course, this is an admittedly recursive goal, given that attracting foreign capital is conditioned on the presence of functional institutions and economic stability. In this context, it is important to point to the interdependencies of policy measures. For example, sustained low inflation rates can only be achieved if budget constraints are hardened. After over a decade of transition, it is clear that each step of these countries towards the market economy

marks more than forward progress, it also leaves an imprint of proof that its policymakers have once again avoided pitfalls never anticipated at the journey's start.

References

- [1] Begg, D. and R. Portes (1993a), Enterprise Debt and Financial Restructuring in Central and Eastern Europe, *European Economic Review*, 37, 396-407.
- [2] Begg, D. and R. Portes (1993b), Enterprise Debt and Economic Transformation: Financial Restructuring in Central and Eastern Europe, in: Mayer, C. and X. Vives (eds.), *Capital Markets and Financial Intermediation*, Cambridge University Press, Cambridge, 230-255.
- [3] Berglöf, E. and P. Bolton (2002), The Great Divide and Beyond: Financial Architecture in Transition, *Journal of Economic Perspectives*, 16 (1), 77-100.
- [4] Berglöf, E. and G. Roland (1997), The EU as an "Outside Anchor" for Transition Reforms, SITE Working Paper, No. 132, Stockholm School of Economics, Stockholm.
- [5] Berglöf, E. and G. Roland (1998), Soft Budget Constraints and Banking in Transition Economies, *Journal of Comparative Economics*, 26, 18-40.
- [6] Buch, C. (1996), *Creating Efficient Banking Systems: Theory and Evidence from Eastern Europe*, Kieler Studien, 277, J.C.B. Mohr(Siebeck), Tübingen.
- [7] Burniaux, J.-M. (1995), Establishing Financial Discipline: Experience with Bankruptcy Legislation in Central and Eastern European Countries, *OECD Economic Studies*, 25 (II), 110-151.
- [8] Business Central Europe (2000), Watershed: A Survey of Banking, September 2000, 51-62.
- [9] Calvo, G.A. and F. Coricelli (1994), Inter-enterprise Arrears in Economies in Transition, *Empirica*, 21 (1), 37-53.

- [10] Carlin, W., Fries, S., Schaffer, M. and P. Seabright (2000), Barter and Non-Monetary Transactions in Transition Economies: Evidence from a Cross-Country Survey, CERT Discussion Paper No 00/04, Heriot-Watt University, Edinburgh.
- [11] Clifton, E.V. and M.S. Khan (1993), Inter-enterprise Arrears in Transforming Economies: The Case of Romania, IMF Staff Papers, 3, IMF, Washington, 680-696.
- [12] Commander, S. and C. Mummsen (2000), The Growth of Non-Monetary Transactions in Russia: Causes and Effects, in: Seabright, P. (ed.), *The Vanishing Ruble: Barter Networks and Non-Monetary Transactions in Post-Soviet Societies*, Cambridge University Press, Cambridge, 114-146.
- [13] Daianu, D. (1994), Inter-enterprise Arrears in a Post-Command Economy: Thoughts from a Romanian Perspective, IMF Working Paper, WP/94/54, IMF, Washington.
- [14] Daianu, D. (1999), Structure, Strain and Macroeconomic Dynamic in Romania, Paper presented at the conference *Romania 2000 - 10 Years of Transition Past, Present, Future* organised by the World Bank, The World Bank, Washington.
- [15] De Melo, Denzier, C., Gelb, A. and S. Tenev (1997), Circumstances and Choice: The Role of Initial Conditions and Policies in Transition Economies, World Bank Policy Research Paper, 1866, The World Bank, Washington.
- [16] Demirgüç-Kunt, A. and V. Maksimovic (2001), Firms as Financial Intermediaries: Evidence from Trade Credit Data, World Bank Policy Research Paper, 2696, The World Bank, Washington.
- [17] Dewatripont, M. and E. Maskin (1995), Credit and Efficiency in Decentralized Economies, *Review of Economic Studies*, 62, 541-556.
- [18] EBRD (1999), *Transition Report 1999*, European Bank for Reconstruction and Development, London.
- [19] EBRD (2001) *Transition Report 2001*, European Bank for Reconstruction and Development, London.

- [20] European Commission (2001), Progress towards Meeting Economic Criteria for Accession: Assessment from the 2001 Regular Report, Enlargement Papers, No. 6, European Commission, Brussels.
- [21] European Commission (2002), Accession Negotiations: State of Play, July, 29.-30. 2002, European Commission, Brussels.
- [22] Fischer, S. and R. Sahay (2000), The Transition Economies after Ten Years, IMF Working Paper, WP/00/30, IMF, Washington.
- [23] Frydman, R., Gray, C., Hessel, M. and A. Rapaczynski (2000), The Limits of Discipline: Ownership and Hard Budget Constraints in the Transition Economies, *Economies of Transition*, 8(3), 577-601.
- [24] Gray, C.W., Schlorke, S. and M. Syanyi (1996), Hungary's Bankruptcy Experience, 1992-93, *The World Bank Economic Review*, 10 (3), 425-50.
- [25] Greene, W.H. (1997), *Econometric Analysis*, 3. edition, Prentice-Hall, Englewood Cliffs, N.J.
- [26] Ickes, B.W. and R. Ryterman (1992), The Inter-enterprise Arrears Crisis in Russia, *Post-Soviet Affairs*, 8(4), 331-361.
- [27] Ickes, B.W. and R. Ryterman (1993a), Roadblock to Economic Reform: Inter-Enterprise Debt and the Transition to Markets, *Post-Soviet Affairs*, 9(3), 231-252.
- [28] Ickes, B.W. and R. Ryterman (1993b), Financial Underdevelopment and Macroeconomic Stabilization in Russia, in: Caprio, G., Folkerts-Landau, D. and T.D. Lane (eds.) *Building Sound Finance in Emerging Market Economies*, Proceedings of a conference held by the IMF and World Bank in Washington, IMF and The World Bank, Washington.
- [29] IMF (2001), Romania: Selected Issues and Statistical Appendix, IMF Country Report, 01/06, IMF, Washington.
- [30] Jaffee, D. and J. Stiglitz (1990), Credit Rationing, in: Friedman, B. M. and F.H. Hahn (eds.), *Handbook of Monetary Economics*, North-Holland Publ., Amsterdam, 837-888.
- [31] Jain, N. (2001), Monitoring Costs and Trade Credit, *The Quarterly Journal of Economics and Finance*, 41, 89-110.

- [32] Johnson, S., McMillan, J. and C. Woodruff (1999), Contract Enforcement in Transition, CEPR Discussion Paper, 2081, CEPR, London.
- [33] Kim, B.-Y., Pirttilä, J. and J. Rautava (2001), Money, Barter and Inflation in Russia, BOFIT Discussion Papers, 2001/15, BOFIT, Helsinki.
- [34] King, R.G. and R. Levine (1993a), Financial Intermediation and Economic Development, in: Mayer, C. and X. Vives (eds.), *Capital Markets and Financial Intermediation*, Cambridge University Press, Cambridge, 156-189.
- [35] King, R.G. and R. Levine (1993b), Finance and Growth: Schumpeter Might be Right, *The Quarterly Journal of Economics*, August, 717-737.
- [36] Kornai, J. (1979), Resource-constrained versus Demand-constrained, *Econometrica*, 47, 801-819.
- [37] Kornai, J. (1980), *Economics of Shortage*, North-Holland Publ., Amsterdam.
- [38] Kornai, J. (2001), The Road to a Free Economy – Ten Year’s After, Author’s comments on his original book at the 2000 World Bank Conference in Washington, D.C., The International Bank for Reconstruction and Development/The World Bank (eds.), *Annual World Bank Conference on Development Economics*, 49-63, The World Bank, Washington.
- [39] Mitchell J. (1993), Creditor Passivity and Bankruptcy: Implications for Economic Reform, in: Mayer, C. and X. Vives (eds.), *Capital Markets and Financial Intermediation*, Cambridge University Press, Cambridge, 197-224.
- [40] Mitchell, J. (1998), Strategic Creditor Passivity, Regulation and Bank Bailouts, CEPR Discussion Paper, 1780, CEPR, London.
- [41] Mizsei, K. (1994), Bankruptcy and Banking Reform in the Transition Economies in Central and Eastern Europe, in: Bonin, J.P. and I.P. Székely (eds.), *The Development and Reform of Financial Systems in Central and Eastern Europe*, Edward Elgar Publishing, Aldershot, 132-151.
- [42] Nilsen, J.H. (2002), Trade Credit and the Bank Lending Channel, *Journal of Money, Credit and Banking*, 34(1), 226-253.

- [43] OECD (2002), OECD Economic Surveys: Romania - Economic Assessment, OECD, Paris.
- [44] Perotti, E.C. (1998), Inertial Credit and Opportunistic Arrears in Transition, *European Economic Review*, 42, 1703-1725.
- [45] Perotti, E.C. (1999), Collusive Trade Credits and Stabilization Policies, in: Helmenstein, C. (ed.), *Capital Markets in Central and Eastern Europe*, Edward Elgar Publishing, Cheltenham, 210-225.
- [46] Petersen, M.A. and R.G. Rajan (1997), Trade Credit: Theories and Evidence, *The Review of Financial Studies*, Vol. 10 (3), 661-691.
- [47] Pop-Eleches, C. and G. Pop-Eleches (2001), Is Shock Therapy for Everyone? Romania's Economic Performance in Comparative Perspective, paper presented at the Annual Meeting of the American Political Science Association 2001, American Political Science Association, San Francisco.
- [48] Rostowski, J. (1994), Inter-enterprise Arrears in Post-Communist Economies, IMF Working Paper, WP/94/43, IMF, Washington.
- [49] Santarossa, L.D. (2001), Arrears as a Sign of Financial Repression in Transition Economies: The Case of Romania, CERT Discussion Paper 2001/04, Heriot-Watt University, Edinburgh.
- [50] Schaffer, M.E. (1998), Do Firms in Transition Economies have Soft Budget Constraints? A Reconsideration of Concepts and Evidence, *Journal of Comparative Economics*, 26, 80-103.
- [51] Schaffer, M.E. (2000), Should We be Worried About the Use of Trade Credit and Non-Monetary Transactions in Transition Economies? Discussion, *Economic Systems*, 24 (1), 55-61.
- [52] Stiglitz, J.E. (1994), *Wither Socialism?*, MIT Press, Cambridge, Mass.
- [53] World Bank (1998), World Development Indicators 1998, The World Bank, Washington.

	Hungary	Romania
number of firms in the sample	78	80
percentage of firms with		
overdue liabilities to banks	10	34
overdue liabilities to the government	18	44
overdue liabilities to other firms	38	64
overdue receivables owed to banks, the government and households	3	8
overdue receivables owed to other firms	69	65
financial difficulties (for three or more years)	34	31
percentage of export-oriented firms	24	9
number of employees		
mean	363	2673
median	115	647
st.dev.	664	5002

Source: own calculations using survey data

Table 1: Descriptive statistics

Dependent variable	overdue liabilities		overdue liabilities to other firms	
	(1)	(2)	(3)	(4)
constant	-1.0448 (-1.60)	-0.8628 (-1.27)	-1.8710** (-2.33)	-1.7237** (-2.09)
employment	-0.0003 (-0.76)	-0.0001 (-0.16)	-0.0001 (-0.07)	0.0002 (0.33)
	(-0.0001)	(-0.0001)	-0.0001	(0.0001)
financial difficulties	1.3405** (2.62)	1.4103** (2.67)	0.8651* (1.71)	0.9318* (1.80)
	(0.3341)	(0.3515)	(0.1991)	(0.2139)
overdue receivables ⁺	0.5935 (0.85)	0.7717 (1.04)	1.1202 (1.34)	1.3420 (1.53)
	(0.1479)	(0.1923)	(0.2578)	(0.3081)
state-owned firms		-0.8515 (-0.87)		-0.5200 (-0.54)
		(-0.2122)		(-0.1194)
privatised firms		-0.4666 (-0.78)		-0.6156 (-1.01)
		(-0.1163)		(-0.1413)
export orientation		-0.4335 (-0.74)		-0.1665 (-0.28)
		(-0.1067)		(-0.0377)
no. of obs.	78	78	78	78
χ^2	8.43	9.92	5.94	7.08
Prob> χ^2	0.038	0.13	0.115	0.313

Estimation method: Logit model

Notes: * = significant at 10%, ** =significant at 5%,

⁺ in regressions (3) and (4) overdue receivables from trade included

t-statistics in the first, marginal effects in parentheses below

Table 2: Regression results for Hungary

Dependent variable	overdue liabilities		overdue liabilities to other firms	
	(1)	(2)	(3)	(4)
constant	-1.358**	-1.8912**	-2.5104**	-3.1509**
	(-2.24)	(-2.51)	(-3.05)	(-3.24)
employment	0.0003	0.0001	0.0001	-0.0001
	(1.19)	(0.09)	(0.89)	(-0.01)
	(0.0001)	(0.0001)	0.0001	-0.0001
financial difficulties	0.6762	0.1776	0.7709	0.0611
	(0.85)	(0.18)	(0.97)	(0.06)
	(0.0592)	(0.0171)	(0.1423)	(0.0112)
overdue receivables ⁺	2.9165**	3.2090**	3.8938**	4.0157**
	(3.92)	(3.75)	(4.33)	(4.18)
	(0.2550)	(0.3107)	(0.7186)	(0.7345)
state-owned firms		2.5664**		2.0737*
		(2.20)		(1.87)
		(0.2484)		(0.3793)
privatised firms		0.4872		1.3149
		(0.42)		(0.97)
		(0.0472)		(0.2405)
export orientation		-0.7473		-0.2517
		(-0.53)		(-0.19)
		(-0.0923)		(-0.0485)
no. of obs.	80	80	80	80
χ^2	35.80	42.34	46.05	50.60
Prob> χ^2	0.00	0.00	0.00	0.00

Estimation method: Logit model

Notes: * = significant at 10%, ** = significant at 5%,

⁺ in regressions (3) and (4) overdue receivables from trade included

t-statistics in the first, marginal effects in parentheses below

Table 3: Regression results for Romania

BOFIT Discussion Papers

- 2001**
- No 1 Igor Vetlov: Dollarization in Lithuania: An Econometric Approach
 - No 2 Malgorzata Markiewicz: Quasi-fiscal operations of central banks in transition economies
 - No 3 Ville Kaitila: Accession Countries' Comparative Advantage in the Internal Market: A Trade and Factor Analysis
 - No 4 Laura Solanko: Fiscal competition in a transition economy
 - No 5 Alessandra Guariglia-Byung-Yeon Kim: The Dynamics of Moonlighting: What is happening in the Russian Informal Economy?
 - No 6 Alexei Medvedev: International investors, contagion and the Russian crisis
 - No 7 Mark De Broeck and Torsten Sløk: Interpreting Real Exchange Rate Movements in Transition Countries
 - No 8 Jarko Fidrmuc: The Endogeneity of optimum currency area criteria, intraindustry trade and EMU enlargement
 - No 9 Iikka Korhonen: Some empirical tests on the integration of economic activity between the Euro area and the accession countries
 - No 10 Tuomas Komulainen: Currency Crises in Emerging Markets: Capital Flows and Herding Behaviour
 - No 11 Kari Heimonen: Substituting a Substitute Currency - The Case of Estonia
 - No 12 Jan Winiecki: The role of the new, entrepreneurial private sector in transition and economic performance in light of the successes in Poland, the Czech Republic and Hungary
 - No 13 Vadims Sarajevs: Convergence of European transition economies and the EU: What do the data show
 - No 14 Jarko Fidrmuc - Iikka Korhonen : Similarity of supply and demand shocks between the Euro area and the CEECs
 - No 15 Byung-Yeon Kim, Jukka Pirttilä, Jouko Rautava: Money, Barter and Inflation in Russia
 - No 16 Byung-Yeon Kim: Determinants of Inflation in Poland: A Structural Cointegration Approach
 - No 17 Pekka Sutela: Managing capital flows in Estonia and Latvia
- 2002**
- No 1 Ali M. Kutan and Niina Pautola-Mol: Integration of the Baltic States into the EU and Institutions of Fiscal Convergence
 - No 2 Juha-Pekka Niinimäki: Bank Panics in Transition Economies
 - No 3 Jouko Rautava: The role of oil prices and the real exchange rate in Russia's economy
 - No 4 Marketta Järvinen: Exchange rate regimes and nominal convergence in the CEECs
 - No 5 Axel Brüggemann and Thomas Linne: Are the Central and Eastern European transition countries still vulnerable to a financial crisis? Results from the signals approach
 - No 6 Balázs Égert: Investigating the Balassa-Samuelson hypothesis in transition: Do we understand what we see?
 - No 7 Maurizio M. Habib: Financial contagion, interest rates and the role of the exchange rate as shock absorber in Central and Eastern Europe
 - No 8 Christoph Fischer: Real currency appreciation in accession countries: Balassa-Samuelson and investment demand
 - No 9 John Bonin and Paul Wachtel: Financial sector development in transition economies. Lessons from the first decade
 - No 10 Juhani Laurila: Transition in FSU and sub-Saharan countries: The role of institutions
 - No 11 Antje Hildebrandt: Too many to fail? Inter-enterprise arrears in transition economies

BOFIT Discussion Papers

ISBN 951-686-838-X(print)
ISSN 1456-4564 (print)

ISBN 951-686-839-8 (online)
ISSN 1456-5889 (online)

Editor-in-Chief **Iikka Korhonen**

Bank of Finland
Institute for Economies in Transition BOFIT
PO Box 160
FIN-00101 Helsinki

Phone: +358 9 183 2268
Fax: +358 9 183 2294
bofit@bof.fi

www.bof.fi/bofit
