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On the Causes of Soft Budget Constraints: Firm-Level Evidence from Bulgaria and Romania

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LICOS Centre for Transition Economics

LICOS Discussion Paper

Discussion Paper 109/2001

**On the Causes of Soft Budget Constraints: Firm-Level Evidence from Bulgaria
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On the Causes of Soft Budget Constraints: Firm-level Evidence from Bulgaria and Romania

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Abstract

Several theoretical explanations for the presence of soft budget constraints have recently been put forward in the literature. The purpose of this paper is to empirically test these theories on the causes of soft budget constraints. We therefore use a panel data set, consisting of company account data for Bulgarian and Romanian manufacturing firms, covering the period 1995-1999. Our results suggest that the probability of finding soft budget constraints importantly depends on the degree of competition within the sector and on the ownership structure of the firm. Ownership structure in Bulgaria, however, has no additional explanatory power once firms are loss-making. We further find that socio-political concerns about employment increase the probability of SBCs, but only when firms are loss-making. Thus, our empirical results largely confirm the hypotheses that competition, privatisation, and firm size matter in explaining soft budget constraints, as is suggested in the theoretical models on the causes of soft budget constraints.

JEL-classification: P31, P35, L10

Keywords: Soft Budget Constraints, Competition, Privatisation, Transition

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1 Introduction

The transition towards a market-based economy in Central and Eastern Europe has offered a natural experiment for testing the wide-held view in economics that competition and private ownership contribute to better economic performance. Consequently, a vast empirical literature has evolved around explaining firm performance by ownership structure and by the degree of competition. Typically, this strand of research suggests superior firm performance for private companies - although not necessarily when these enterprises are characterised by mixed forms of ownership, when they have been previously state-owned or when they featured insider-privatisation (Boardman and Vining, 1989; Konings, 1997, Blanchard, 1997) - and for firms in more competitive industries (Nickell, 1996; Konings, 1997; Brown and Earle, 2000).

Our paper takes up the question whether product-market competition and ownership structure can explain the prevalence of soft budget constraints. The concept of soft budget constraints (SBCs) was introduced in the literature by Kornai (1980) and refers to a situation where loss-making firms are bailed out or refinanced. In Kornai's (1980) definition, bailing out loss-making firms arises from a paternalistic attitude of the government. The latter aims at preserving employment and the survival of these firms, despite their negative profitability. Closely related to the paternalistic explanation of SBCs are political economy models of SBCs. Shleifer and Vishny (1994) argue that entrepreneurs' political influence automatically gives rise to bribes, subsidies, ... Alternatively, Dewatripont and Maskin (1995) explain the existence of SBCs as the outcome of a commitment problem in the presence of sunk costs¹. In their model, institutional conditions such as state-ownership, centralisation of credit and a lack of competition increase the probability of SBCs. Along similar lines, Segal (1998) argues that a lack of competition makes SBCs more likely to occur.

The purpose of this paper is to empirically test for the various causes of SBCs that have been suggested in the theoretical literature. Do privately-owned firms and firms in more competitive industries suffer less from SBCs? To what extent can socio-political motives, like employment considerations, account for the incidence of SBCs? So far, empirical work on SBCs has been limited. Schaffer (1998) assesses the importance of the different forms of SBCs, arguing that tax arrears are the main channel through which the government continues to support its firms. Other documentary evidence on SBCs comes from the EBRD (1999) and the World Bank (1999), stressing the importance of non-collected

¹Thus, in contrast with Kornai's (1980) approach which assumes that the paternalistic state attitude is exogenously given, Dewatripont and Maskin (1995) give an endogenous explanation for SBCs.

bills from state utility suppliers. Clifton and Khan (1993) discuss interenterprise arrears in Romania. The bulk of empirical work related to SBCs, however, focusses on the effects of SBCs in explaining firm or macro performance in Central and Eastern European countries². This paper, on the other hand, tries to explain the prevalence of SBCs themselves. In this respect, our work bears some resemblance to that of Li and Liang (1998) who test for SBC-theories in China.

In trying to explain for SBCs, we use an unbalanced panel data set consisting of company account data for Bulgarian and Romanian manufacturing firms covering the period 1995-1999. Bulgaria and Romania are typically slow reformers (EBRD, 2000). This makes them more likely to be prone to SBCs and more suitable for testing theories on SBCs. Moreover, both countries experienced an arrears crisis. In Bulgaria, the run-up of soft bank credit and non-performing loans were at the basis of the 1996 banking crisis. In Romania, firms repeatedly stopped paying each other, gambling on a collective bail out (Perotti, 1998; Clifton and Khan, 1993). From these experiences, it follows that the main source of SBCs has been different in both countries. Our SBC-variable will be accommodated to be able to capture both sources of SBCs. More specifically, we use a logit approach where a dummy variable, indicating the presence of SBCs, acts as the dependent variable. The latter variable is based on a measure for bank-related SBCs as suggested by Schaffer (1998). In addition, we propose an alternative SBC-measure capturing interenterprise arrears.

Our results suggest that the probability of finding SBCs importantly depends on the degree of competition within the sector and on the ownership structure of the firm. Ownership structure in Bulgaria, however, has no additional explanatory power once firms are loss-making. We further find that socio-political concerns about employment increase the probability of SBCs, but only when firms are loss-making. Thus, our results confirm the hypotheses that competition, privatisation, and firm size matter in explaining soft budget constraints, as was suggested in the theoretical models on the causes of SBCs.

A number of papers have explicitly addressed the issue of the adverse effects of SBCs, both on theoretical and on empirical grounds. SBCs are believed to hamper innovation (Qian and Xu, 1998), the restructuring of firms and an efficient resource allocation (Dewatripont and Roland, 1996, Kornai, 1980), output, (Schaffer, 1989), economic growth (Huang and Xu, 1999) and free trade (Everaert and Vandenbussche, 2001). Consequently, the hardening of SBCs is at the heart of the reform process in Central and Eastern European Countries and therefore of primary concern to policy-makers. Once more, this paper draws the attention of policy-makers to the importance of raising competitive pressure in transition economies and of continuing privatisation programs to reduce the prevalence of SBCs.

The remaining of the paper is structured as follows. In section 2, we sketch the theoretical framework for testing SBC-theories and formulate the hypotheses we want to test. Section 3 describes the variables and the data set we use and

²E.g. Earle and Estrin (1998), Dobrinsky, Dochev and Nikolov (1997), Konings and Vandenbussche (2000), Majumdar (1998), Bertero and Rondi (2000), Raiser (1993,1994).

gives some descriptive statistics. Empirical results are presented in section 4. A discussion of the results can be found in section 5. A final section comments and concludes.

2 Theoretical background

In this section we will outline the theoretical framework for testing SBC-theories. This theoretical literature has recently been summarised by Maskin and Xu (2001). Therefore, rather than presenting a comprehensive literature survey, we will concentrate on the main themes that can be distilled from this literature and we will translate these into testable hypotheses.

Firstly, we expect firms with higher levels of employment to be more likely to benefit from SBCs. Socio-political motives such as aiming to preserve and/or maximise employment and output usually support the idea that, in socialist countries, firms are not allowed to go bankrupt, but are being bailed out. A paternalistic government attitude (Kornai, 1980) or managers' incentives under socialism³ underlie this hypothesis.

A second hypothesis is that decentralisation helps to establish harder budget constraints. This is clearly illustrated in the model of Dewatripont and Maskin (1995) who give an endogenous explanation of SBCs. In their model, bad investment decisions are made because of creditors' lack of information about the quality of the project and because of a lack of commitment on the creditors' side not to refinance bad projects, once some irreversible investment has been made. Consequently, solving the asymmetric information problem and the commitment problem not to bail out bad projects are at the heart of hardening SBCs in this type of models. This can be achieved through decentralisation: making the market more transparent⁴ and more competitive. More specifically, Dewatripont and Maskin (1995) argue that, if refinancing takes place in a competitive credit market with a large number of small creditors - compared to when refinancing is done by the same monopolist creditor - the likelihood of a bail out is smaller, given the fact that small creditors face liquidity constraints which makes ex-post renegotiation of credit more difficult. Anticipating these difficulties, bad investment decisions will not be made, rendering a bail out superfluous. Thus, competition between creditors hardens budget constraints.

Building on the model of Dewatripont and Maskin (1995), Dewatripont and Roland (1996) consider the case where a single creditor has to finance a multitude of projects. Now, competition at the producers' side decreases the probability of a bail out, such that fewer bad investments are made. Again, budget constraints are harder under competitive pressure.

³Notice that the expectation of a future government bail out will precisely distort incentives and make firms more prone to run losses. Hence the bail-out expectation can become a self-fulfilling prophesy.

⁴In this paper, we do not explicitly address the asymmetric information problem any further. Theoretical work on solving the asymmetric information effects of SBCs through screening includes the paper by Bai and Wang (1998). Models where effort is monitored are suggested by Qian and Roland (1998).

A similar effect of competition through trade linkages is illustrated by Berglöf and Roland (1998). When strong one-to-one relations between suppliers and buyers exist, liquidation of one loss-making firm - i.e. when it is not bailed out - will be very costly, given the negative spill-over effects to this firm's trading partners. Consequently, introducing more competition will weaken these negative spill-over effects and make the liquidation option more credible, resulting in harder budget constraints. Competition also works through competition between old and new projects, as in Berglöf and Roland (1998), or via competition for funds between regional governments as explained by Qian and Roland (1998) for China. In a different setting, Segal (1998) equally demonstrates the importance of competition in the hardening of budget constraints. When the market is serviced by sufficiently many firms, other firms can make up for the output loss following the liquidation of a defaulting firm. This makes the social cost of liquidation smaller and more feasible. In all cases, the driving mechanism is that the likelihood of a future bail out decreases under competition. Thus, an overwhelming body of the literature stresses different ways in which competition might contribute to harden budget constraints.

Finally, the Dewatripont and Maskin (1995) model also illustrates the effects of privatisation. When the creditor is a profit maximising agent, instead of a welfare maximising government, its objective function will be less comprehensive. Therefore, the pay off from refinancing a bad investment project will less likely exceed the value of liquidation, making the latter option more attractive. This prevents bad investment projects from being made and hardens budget constraints. Along similar lines, one could argue that profit maximisation incentives are stronger for foreign owned firms in Central and Eastern Europe or that insider privatisation will be less effective in disciplining firms compared to domestic private ownership (Blanchard, 1997). We hypothesise to find these ownership effects in the data.

3 Data description

In order to test the fore-mentioned theories on SBCs, we use an unbalanced panel data set of company data from Bulgarian and Romanian manufacturing firms⁵, covering the period 1995-1999. Bulgaria and Romania are typical countries lagging behind in the transition process, compared to the more successful CEE-countries like Poland or Hungary, as can be seen from their low value of enterprise restructuring and banking reform indices in Table 1⁶. Privatisation processes took off only in the second half of the 1990s. Consequently, these countries are more likely to be characterised by SBCs. Moreover, the choice of Bulgaria and Romania allows us to compare results from testing SBC-theories in a small open and a larger, more closed economy respectively.

⁵All firms were active in manufacturing as their principle activity throughout the whole sample period 1995-1999.

⁶A higher value for the indices stands for further progress towards market-based economy practices. The highest possible value for the indices is 4.3.

	Bulgaria	Czech Rep.	Hungary	Poland	Romania
enterprise reform index	2.3	3.0	3.3	3.0	2.0
banking reform index	2.7	3.3	4.0	3.3	2.7
small-scale privatisation	3.3	4.3	4.3	4.3	3.7
large-scale privatisation	3.0	4.0	4.0	3.3	2.7
Source: EBRD (1999), Transition Report					

Table 1: Reform indices in Central and Eastern European countries

year	Bulgaria		Romania	
	mean	st.dev.	mean	st.dev.
1994	428	843	893	1755
1995	390	792	797	1591
1996	362	739	745	1493
1997	341	699	636	1249
1998	307	617	564	1085
Source: own calculations using AMADEUS Data				

Table 2: Size of firms: Number of employees

The firm-level data are taken from the AMADEUS CD-ROMs, distributed by the Bureau van Dijk, Belgium. Data are restricted to large and medium sized firms, i.e. firms which are either characterized by an employment level exceeding 100 or which have total assets and total sales exceeding \$12 million.

To test the first hypothesis that firm size increase the likelihood of SBCs, we use firm-level employment figures. Descriptive statistics are presented in Table 2. Both countries experienced a decline over time in average firm size. However, initial conditions at the start of transition were rather different, with Romanian firms being much bigger than Bulgarian enterprises. This heritage is reflected in our data.

For testing the hypothesis that competition makes SBCs less likely to occur, we need data on the degree of competition. Therefore, we include Herfindahl indices and import penetration ratios on the 3-digit NACE level⁷. The Herfindahl index is calculated as the sum of squares of market shares of all firms in the relevant industry and ranges between 0 and 1. A high value for the Herfindahl index thus corresponds to high industry concentration in the sector. The import penetration ratio is measured as total imports over the sum of total sales and imports in the sector, also ranging between 0 and 1. Sectors that face fierce competition from abroad will consequently feature a high import penetration ratio. Thus, these indices reflect the overall degree of domestic versus foreign competitive pressure within the sector. Data were obtained from the Statistical Office of Bulgaria and Romania respectively for the period 1994-1998, such that we use lagged values of these variables in our regressions. Descriptive statistics

⁷Notice that we match the herfindahl and import penetration ratio according to the principal activity reported by the firm.

year	Bulgaria			Romania		
	median	mean	st.dev.	median	mean	st.dev.
1994	20.56	30.71	27.66	27.41	61.06	27.97
1995	16.37	27.07	26.13	22.57	57.90	27.77
1996	16.45	27.60	28.51	27.86	56.46	28.52
1997	16.52	25.28	24.96	23.36	53.07	28.29
1998	14.78	20.22	18.76	21.74	50.92	28.91

Sources. Statistical Offices of Bulgaria and Romania, own calculations (in %)

Table 3: Concentration of manufacturing firms in Bulgaria and Romania: Herfindahl indices

year	Bulgaria			Romania		
	median	mean	st.dev.	median	mean	st.dev.
1994	32.40	37.81	27.60	14.06	25.80	28.97
1995	33.82	37.77	27.96	14.76	30.05	24.54
1996	31.17	39.12	27.65	19.48	32.43	26.61
1997	34.38	40.37	28.87	21.25	30.49	24.63
1998	39.60	42.85	29.76	26.93	36.66	28.96

Sources. Statistical Offices of Bulgaria and Romania, own calculations (in %)

Table 4: Import penetration of manufacturing industries in Bulgaria and Romania

on Herfindahl indices and import penetration ratios are presented in Tables 3 and 4. The overall drop in industry concentration and the general upward trend in import penetration reflect the gradual process of reform in both countries. The fact that import penetration is on average higher in Bulgaria is consistent with our claim that the Bulgarian economy is more open, whereas Romania is more closed. The difference between Romania and Bulgaria is even more pronounced for the concentration index in Table 3 and Figures 1 and 2. Many big conglomerates in Bulgaria were indeed split up as early as 1992, following the Demonopolisation Act of 1992. This led to an important reduction in concentration ratios (Djankov and Hoekman, 2000). However, firms were often split up in complementary parts, such that lower levels of concentration not necessarily reflect an increase in product market competition. For this reason and following Nickell (1996), we use first differences of the indices in the econometric analysis, as the latter better reflect actual changes in competition patterns. However, the sector-level changes in the concentration ratios for Romania are very small, so that for Romania we use the levels for both variables instead⁸.

The AMADEUS data also allowed us to trace down the ownership structure of the firms for the years 1997-1999. The ownership structure for the preceding years was not available and therefore we assume it to be the same as the owner-

⁸Results for the regressions, using the differences, are reported in the appendix.

majorities	country	1997	1998	1999
state-owned	Bulgaria	26.1	16.2	15.9
	Romania	37.7	37.9	18.6
private-owned	Bulgaria	19.3	30.2	33.6
	Romania	40.0	39.5	49.9
foreign-owned	Bulgaria	5.2	8.4	8.3
	Romania	10.4	10.4	19.4
insiders/coop	Bulgaria	6.5	5.3	5.2
	Romania	2.6	2.7	2.7
municipalities	Bulgaria	2.4	2.4	2.2
	Romania	n.a.	n.a.	n.a.
privatised and mass privatised	Bulgaria	n.a.	n.a.	n.a.
	Romania	56.3	56.9	66.0
Source: own calculations using AMADEUS Data				

Table 5: Ownership structure: Percentage of firms in which one of the various owners has the majority

ship structure for 1997 in our regressions⁹. Ownership information includes the name and nationality of the owner and his/her direct ownership share. We could consequently identify various ownership categories - state, municipalities¹⁰, foreign investors, private investors and insider-owned companies or cooperatives - and we could construct dummies for the various owners involved¹¹, dummies for full, majority or minority ownership¹² or for various forms of mixed ownership. Table 5 shows the percentage of firms in our sample in which the listed owners have a majority stake.

As can be seen from Table 5, the state is still an important ownership partner in both countries, although state-ownership is on the downward trend, whereas private and foreign ownership are of increasing importance in our sample¹³. There are also an important number of insider-privatised firms¹⁴. This information will tell us whether the third hypothesis - privatisation hardens budget discipline - holds.

Obviously, ownership information is sometimes incomplete, and the indices we use on competitive forces serve only as a proxy. Our data do not e.g. allow us to distinguish between *de novo* firms and privatised firms, thereby leaving the theory of Berglöf and Roland (1998) on competition between new and old

⁹However, this assumption does not change our results (see Section 5).

¹⁰Ownership by municipalities was only available for Bulgaria.

¹¹i.e. the dummy reports whether a certain owner category has a stake in the firm, irrespective of the importance of its ownership share.

¹²A firm is said to be majority owned when one ownership category has a stake of more than 50%. For minority ownership, an owner needs to own at least 33% of the firm.

¹³There were only a small number of mass-privatised firms in Romania. Therefore, we considered them together with privately owned firms in the regressions

¹⁴Insider-owned companies are often not very different from cooperatives. Therefore, we consider these two categories together in the regressions for Bulgaria.

firms outside the scope of our analysis. Neither can we assess the extent of competition on the creditor's side (Dewatripont and Roland, 1996) nor the strength of trade linkages between buyers and suppliers (Berglöf and Roland, 1998). Competition in foreign export markets can be an additional source of competitive and disciplining pressure. However, this information is lacking in our data set. Nonetheless, we believe that our data on ownership are sufficiently representative and that the indices on concentration and import penetration give a good overall indication of domestic versus foreign competitive pressure and can be used as such in the econometric analysis.

The dependent variable in our analysis is a measure for SBCs. SBCs can take various forms: tax arrears, interenterprise arrears, non-payment of bills from state utility suppliers, soft bank credit, ... Our data allow us to identify both SBCs that are due to interenterprise arrears and SBCs that originate from within the banking sector. For the latter, we use a measure of SBCs based on Schaffer (1998). A firm is then said to have net-bank-financing SBCs (NSBCs) when it receives net bank financing (NBF), despite its negative profitability. NBF is defined as the net increase in outstanding debts¹⁵ over total assets, multiplied by one hundred.

$$NBF_t = \frac{debt_t - debt_{t-1}}{total\ assets_t} * 100, \quad (1)$$

Our measure for NSBC thus takes the value of 1 when NBF_t is positive and operating profit or loss in year t is negative; it is 0 otherwise^{16,17}. Consequently, this measure reflects which firms 'undeservedly' obtain extra credit. In Figures 5 and 6, NSBC-firms are located in the upper-left side of the diagram.

Alternatively, SBCs also appear in the form of interenterprise arrears¹⁸ (Clifton and Khan, 1993; Perotti, 1998). Therefore, we want to identify the firms that benefit from unacceptably generous credit margins, reflecting their inability to pay. Along the same lines, we now define a variable for credit-related SBCs (CSBCs) that takes on the value of 1 when the firm is loss-making in year t and benefits from a credit period that is larger than the average credit period firms with positive profits in year t enjoy; it is 0 otherwise.

The motivation for taking this measure is illustrated in Table 6. Firms with negative operating profits clearly benefit from more credit days on average

¹⁵We included both short-term liabilities and long-term debt in our measure of debt. Contrary to Schaffer (1998), we do not subtract interest paid, as the non-payment of interest on existing debt already shows the presence of bank arrears. Moreover, data on interest paid were of very bad quality such that it would have significantly reduced the number of observations in our sample. One has to note that short-term liabilities might also include items that are not related to bank finance, like wage arrears, debts to the tax administration or to state utility suppliers. Hence our NSBC-measure should not too narrowly be interpreted.

¹⁶We use 'operating' profit or loss, since we want to identify the firms that are economically unviable, irrespective of their financial structure.

¹⁷Notice that we slightly differ from Schaffer (1998) by considering the value for operating profit or loss in period t instead of in period $t - 1$.

¹⁸Notice that often, the non-payment of bills from state-utility suppliers is reflected in a very high number of credit days, which we are capturing here.

year	operating profit/loss	Bulgaria		Romania	
		mean	st.dev.	mean	st.dev.
1995	positive	26	48	45	54
	negative	48	95	79	116
1996	positive	43	79	42	50
	negative	53	83	105	154
1997	positive	31	47	41	48
	negative	50	69	96	134
1998	positive	24	33	45	55
	negative	45	71	99	122
1999	positive	31	48	45	51
	negative	54	94	85	104

Source: own calculations using AMADEUS Data

Table 6: Credit period in days

and this credit period displays greater variation, as reflected by the standard deviation. On these grounds, our measure for CSBCs can be defended as useful to capture interenterprise arrears. Firms with interenterprise arrears, according to our definition, are displayed at the upper-left in Figures 7 and 8.

Looking at Table 6, we see that NSBCs have been more important in Bulgaria, whereas the relative importance of CSBCs is greater for Romania. The column BSBC indicates the percentage of SBC-firms, having either NSBCs or CSBCs or both. The data on SBCs are well in line with Schaffer (1998) and Dmitrov (1999) who argue that interenterprise arrears were not important for Bulgaria¹⁹, unlike in Romania, where enterprises engaged in collusive arrears anticipating a general government bail out. In Bulgaria instead, a weak banking sector made NSBCs wide-spread. In 1996, when the Bulgarian banking sector experienced a banking crisis, NSBCs dropped to 2%, as all bank finance dried up²⁰. In the empirical part, we will use the variable BSBC, indicating the presence of SBCs of any type.

In addition to this measure of SBCs, we will also consider a refined measure of SBCs, so-called ‘investment-corrected’ BSBCs (abbreviated IBSBCs), where we correct for the possibility that firms are engaged in deep restructuring and need the financial resources to do so. Apart from using internal resources, obtaining extra bank finance is the most straightforward option, given the fact that equity markets are virtually non-existing in these countries. Consequently, firms which we previously classified as NSBC-firms, might be in the process of reorganising their business in the prospect of becoming profit-making in the future. We checked whether NSBC-firms, which by definition have $NBF > 0$,

¹⁹At least not until 1997.

²⁰The drop of NSBCs in Bulgaria in 1996 is not due to more or fewer firms having negative operating profit.

year	Bulgaria				Romania			
	NSBC	CSBC	BSBC	IBSBC	NSBC	CSBC	BSBC	IBSBC
1995	21	13	21	21	4	6	8	7
1996	2	8	9	9	3	5	6	5
1997	13	10	17	12	2	6	7	6
1998	31	18	33	28	9	11	14	13
1999	30	20	36	32	5	12	13	13

NOTES: NSBC refers to net-bank-finance related SBCs, CSBC refers to interenterprise related SBCs and BSBC refers to SBCs of any kind, as explained in the text. IBSBC refers to investment-corrected SBCs.
Source: own calculations using AMADEUS-Data

Table 7: Firms with Soft Budget Constraints (in percent of firms in the whole sample)

also exhibited a positive real increase in tangible fixed assets²¹. In this case, we did not consider the firm to suffer from SBCs. Our refined variable for net-bank-finance related SBCs, INSBC, thus has fewer cases of SBCs, compared to the old NSBC-measure. The variable for CSBCs remains unchanged. The variable IBSBC is constructed analogously, representing the firms that have either INSBCs or CSBCs or both.

4 Empirical Results

As our dependent variable is discrete, we run regressions for explaining SBCs, using a random effects logit approach. In a large panel data set, random effects estimation is an appropriate way to deal with possible heterogeneity problems (Greene, 1997). We run regressions for the entire sample and for the sample, restricted to the firms with negative operating profit²². All regressions include year dummies. Our reference regression will thus feature the following form:

$$BSBC_{i,t} = \alpha + \beta_1 her_{i,t-1} + \beta_2 imp_{i,t-1} + \beta_3 empl_{i,t} + \beta_4 state_{i,t} + \beta_5 foreign_{i,t} + \beta_6 municip_{i,t} + \beta_7 coopinsider + \sum_{t=2}^T year_t + u_i + \varepsilon_{i,t}, \quad (2)$$

where $\varepsilon_{i,t}$ is the white noise disturbance and u_i is the disturbance term accompanying the random effects term.

In Tables 8 and 9 we report the results for Bulgaria and Romania respectively when the entire sample was considered, and when the sample was restricted to

²¹Data on tangible fixed assets were equally available on a firm-level basis in AMADEUS.

²²The latter approach is motivated by the fact that one could argue that - given our definition of SBCs - SBCs could be a proxy for badly performing firms. Consequently, the explanatory variables in our regressions would be explaining performance, instead of identifying which firms, with negative operating profits, operate under SBCs.

loss-making firms. For both countries and both sample-cases, we report various regressions, each including a different subset of variables.

Regression (1) in Tables 8 and 9 only takes into account competition variables and the level of employment within the firm. Competition ratios are included as percentages in the regressions. For both countries, the Herfindahl index is positive, indicating that more concentration within a sector increases the likelihood of SBCs. This coefficient is significant for Romania, but not for Bulgaria. The coefficient for import penetration has the expected negative sign: more import competition is associated with tougher budget discipline. Its significance, however, is low²³. The coefficient for the level of employment has a negative sign, and is even significant for Romania - contrary to Kornai's (1980) hypothesis. This can be explained by the high number of good performing firms in the sample, as can be inferred from Tables 20 and 21. As we will see later, however, this result is not very robust for Bulgaria. The big negative coefficient on the 1996-year dummy for Bulgaria reflects the drop in SBCs due to the banking crisis. In both countries however, SBCs are on the rise over time.

The sign and significance of the variables remain largely unchanged when the ownership structure is added to the regressions, as in column (2) of Tables 8 and 9²⁴. Now, the Herfindahl index becomes significant for Bulgaria, and so does import penetration for Romania. Here, we report the regressions when majority ownership dummies are included. We also experimented with dummies for full or minority ownership, or dummies for the presence of an ownership category. However, the results continue to hold in those regressions. Compared to the case of private ownership, the presence of state-ownership increases the incidence of SBCs significantly in both countries. For Bulgaria, all other ownership variables also bear the expected sign: foreign participation decreases the probability of SBCs, whereas insider-owned firms and municipalities increase this probability²⁵. The case of Romania is somewhat more puzzling, as insider and foreign ownership both have an unexpected sign and are statistically significant.

The remaining columns in Tables 8 and 9 report analogous results when the sample, restricted to loss-making firms, is considered. Here, we test whether the variables we selected to explain the incidence of SBCs, can distinguish between firms with SBCs and firms with hard budget constraints, even when all firms in the sample are loss-making. As can be seen in columns (3) and (4) of Tables 8 and 9, the results for the competition variables are now strengthened: the coefficient on the Herfindahl index is always positive and statistically significant and import penetration is always negative. Moreover, the coefficient on employment now consistently bears the hypothesised positive sign, most of the times being significant. Consequently, firm size does matter in explaining SBCs,

²³Notice, however, that for Romania, the coefficient on import penetration is almost significant at the 10%-level.

²⁴The number of observations in our sample slightly drops because for some firms ownership information was available.

²⁵Notice that the coefficient for municipality ownership is smaller than that of state ownership, in line with the Tiebout competition hypothesis, as incorporated in the SBC-literature by Qian and Roland (1998).

but only when firms are loss-making. The story is somewhat opposite for the ownership variables. Once firms are loss-making, there is hardly any explanatory power left in these variables to account for SBCs, especially in Bulgaria²⁶. For Romania, the results are a little better when purely state and purely foreign owned companies are considered²⁷. The former have a positive significant effect on SBCs, the latter make the coefficient and significance level for foreign ownership considerably smaller, and thus more in line with the theoretical predictions.

Tables 10 and 11 report the same regressions when we used our investment-corrected measure for SBCs. The coefficients of the Herfindahl indices are again positive and import penetration indices negative in all columns, suggesting that domestic and foreign competitive pressure contribute to harder budget constraints. For Bulgaria, the coefficient on employment now turns positive in the unrestricted sample. It continues to be negative for Romania, but it remains insignificant. For both countries, it is again significant and positive in the restricted sample. Results for ownership remain largely unchanged, compared to the results in Tables 8 and 9.

The results thus make a case for believing that privatisation, competition and firm size indeed matter in explaining the prevalence of SBCs in Bulgaria and Romania, as was previously claimed in the theoretical literature on SBCs. As for privatisation, it is undoubtedly clear that state-ownership is associated with a higher incidence of SBCs. We do not consistently find that foreign participation gives rise to fewer SBCs. Foreign investors might e.g. enjoy more freedom to concentrate on strategic considerations - such as attracting qualified workers, establishing their firm reputation and brand name, capturing market share, ... - instead of being profit maximising in the short run. Moreover, they usually have access to foreign equity markets, such that they don't need to rely on bank finance. Finally, the significance of the variables, explaining SBCs in the restricted sample, ensures that we are not taking up a performance effect, but that our SBC-indicators can - within the sample of possibly SBC-firms, i.e. firms with negative operating profit - distinguish between SBC-firms and HBC-firms.

5 Discussion of the results

As the previous regressions show, our results are robust with respect to the sub-sample considered on operating profit or loss. We further performed robustness checks for ownership structure, as we made the assumption that ownership prior to 1997 was the same as in 1997. Especially for Bulgaria this assumption is rather strong, as mass-privatisation occurred during 1996. However, we could

²⁶The ownership distribution is the same in the entire and in the restricted sample. Therefore, the insignificance of the ownership variables cannot be due to a different ownership representation in the sub-sample.

²⁷Using dummies for purely state owned or purely foreign owned enterprises did not change the results for Bulgaria.

identify the state-owned firms that were in the 1996 mass privatisation and input the correct state-ownership share (100%) for the years prior to 1997 for those firms (Centre for Mass Privatisation, 1996). The results, however, remain unchanged. The same holds when using the subsamples 1997-99 and 1998-99 for which the evolution of ownership structure is complete. The results are equally robust with respect to the specification of the ownership dummies included: the results continue to hold when dummies on minority ownership were included or for dummies simply indicating the presence of an ownership category irrespective of the quantitative importance of the ownership share.

We further experimented with taking logarithms, squares of logarithms and with dummies for firms employing as many as 400 people in Bulgaria and 1000 people in Romania. These figures are close to the average employment levels in both countries at the beginning of our sample. Again, results are robust.

As far as our competition variables are concerned, the results for Romania also go through when first differences of the indices are used, instead of the levels (see Table 16 in Appendix). As an alternative measure for concentration, we directly computed market shares from the AMADEUS data and added this variable to our regression (Nickell, 1996). The results for the regressions are included in the Appendix in Tables 12-15. The conclusions we set out earlier for the Herfindahl and import penetration index and for ownership information continue to hold unchanged. Market shares, however, turn out to be negative and significant, implying that higher market shares lower the probability of finding SBCs. Including squares of market shares, however reveals that the relation between market shares and SBCs is non-linear. Small firms that are fiercely competing for market share have little market power to price themselves to positive profits. Larger firms, however, can use their market power to earn positive profits. Firms with very important market shares, however, are typically loss-making and qualify for SBCs. That also explains why in the restricted sample, market share always bears a positive sign, and why the significance of squared market shares in the restricted sample disappears²⁸.

As discussed before, our results go through when our investment-corrected variable for SBCs acts as the dependent variable. The same holds when we constructed a SBC-measure that circumvents the endogeneity that is possibly present in our measure for SBCs. Firms can run positive operating profits exactly because they benefit from SBCs. However, they are not selected via the original procedure. The alternative way to proceed was to compare last year's profits with the current year's *NBF*-measure or with the current year's credit period, but with no major change in the results.

Therefore, we believe that the results make a strong case to believe that increasing competitive pressure and continuing privatisation is of primary importance to policy-makers in Central and Eastern European Countries. In line

²⁸The fact that employment in the unrestricted sample used to have a negative sign might be explained by the fact that it previously took up a market share effect. After correcting for market share, employment indeed becomes positive significant in Bulgaria in the entire sample. For Romania in the entire sample, the sign becomes positive in the specification of column (2).

with previous papers, our results suggest that private ownership can contribute to better performance, making firms less prone to suffer operating losses, but if not complemented by competitive pressure, the merits of privatisation are limited. Especially the results from the restricted regressions suggest strong effects from competition on the hardening of SBCs.

Possible problems with our results are twofold. Firstly, our data set is biased towards large and medium sized enterprises and does not allow us to distinguish between *de novo* private firms and privatised firms. Neither can we follow up the firms which are involved in mergers or split-ups. Secondly, our results possibly suffer from an endogeneity problem. Firms can operate under SBCs because they occupy a strategic position within the sector. However, continued subsidisation can prevent the sector to become more competitive. We have resolved this problem by using lagged variables of the Herfindahl and import penetration index, and by carrying out regressions for the restricted sample. A more explicit dynamic approach or a two-stage procedure could be an interesting extension. Finally, reported profits from firms are often unrealistically squeezed towards zero (see Figures 9 and 10) and this might influence our SBC-variable. This reflects, among others, the unwillingness of firms to report losses or to pay high taxes on profits.

6 Conclusion

The aim of the paper was to shed some new light on the causes of SBCs by assessing their potential to empirically explain the incidence of SBCs in Bulgaria and Romania. We did so by using a panel data set for Bulgarian and Romanian manufacturing firms, covering the period 1995-1999. We used a random effects logit approach to try to explain the causes of SBCs, stemming from soft bank credit or stemming from interenterprise arrears. Therefore, we used Schaffer's (1998) measure for net-bank-financing SBCs and proposed a new measure, based on the credit period a firm enjoys. Our results suggest that the incidence of finding SBCs can be explained by the ownership structure of the firm and the competitive pressure, experienced within the sector. Firm size, as proxied by the level of employment, is another determinant of SBCs, but only once firms are loss-making, or after correcting for market shares. The opposite effect holds with respect to the ownership structure in Bulgaria: for loss-making firms, the ownership structure has no additional explanatory value anymore in explaining SBCs. Ownership, consequently, is a strong indicator for performance, but not for distinguishing between SBC- and HBC-firms, once both are badly performing. Comparing our results with the theoretical predictions of the various models upon which we draw, we can confirm the hypotheses that competition, privatisation and firm size matter in explaining the incidence of SBCs. Finally, our results once again stress the importance of increasing competitive pressure and of continuing privatisation reforms in transition countries. The hardening of budget constraints continues to be of top-priority.

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Estimation method: Logit model with random-effects				
Sample period: 1996-1999				
Dependent variable: Soft Budget Constraints				
	unrestricted sample		restricted sample	
variable	(1)	(2)	(3)	(4)
constant	-1.0311** (-10.607)	-1.1742** (-10.108)	-0.8368** (-5.198)	-1.200** (-5.258)
herfindahl	0.0120 (1.376)	0.0216** (2.065)	0.0342** (2.865)	0.0292* (1.918)
import	-0.0063 (-1.073)	-0.0006 (-0.095)	-0.0151* (-1.642)	-0.0087 (-0.761)
employment	-0.0001 (-0.506)	-0.0001 (-0.164)	0.0007** (2.861)	0.0007** (2.711)
state		0.6221** (3.947)		-0.1671 (-0.908)
insiders/ cooperatives		0.2442 (0.926)		-0.2479 (-0.834)
foreign		-0.0370 (-0.159)		0.4580 (1.265)
municipalities		0.3776 (0.962)		0.2406 (0.483)
year96 ¹	-1.9941** (-13.153)	-2.2116** (-12.258)	2.5671** (10.842)	2.1319** (7.591)
year97 ²	-1.1297** (-8.850)	-1.2988** (-8.731)	1.9855** (8.554)	0.4735* (1.801)
year99	0.2080* (1.918)	0.3510** (2.930)	1.9145** (9.640)	-0.1201 (-0.523)
Wald-chi ²	296.45	277.30	144.67	116.50
Prob>chi ²	0.00	0.00	0.00	0.00
no. of obs.	4657	3780	1557	1283
no. of groups	1401	1225	855	738
Notes: * = significant at 10% level, ** = significant at 5% level				
¹ : referring to year98 in regression (3)				
² : referring to year98 in regression (4)				

Table 8: Logit results for Soft Budget Constraints in Bulgarian firms

Estimation method: Logit model with random-effects					
Sample period: 1995-1999					
Dependent variable: Soft Budget Constraints					
variable	unrestricted sample		restricted sample		
	(1)	(2)	(3)	(4)	(5)
constant	-3.7568** (-20.727)	-4.2896** (-19.445)	0.7057** (2.574)	0.1849 (0.571)	0.5479* (1.742)
herfindahl	0.0082** (2.835)	0.0082** (2.584)	0.0121** (2.848)	0.0170** (3.489)	0.0147** (2.984)
import	-0.0012 (-1.454)	-0.0018* (-1.913)	-0.0006 (-0.495)	-0.0002 (-0.170)	-0.0003 (-0.213)
employment	-0.0001* (-1.922)	-0.0001 (-0.913)	0.0001 (1.098)	0.0002** (2.132)	0.0003** (2.219)
state		0.9281** (5.691)		0.2505 (1.081)	
foreign		1.2868** (6.567)		1.3818** (4.483)	
insiders		-2.5603** (-2.324)		1.1111 (0.567)	
purely state					2.8107** (2.034)
purely foreign					0.4037 (0.899)
year96	-0.2157 (-1.312)	-0.2706 (-1.478)	-0.3678 (-1.186)	-0.5457 (-1.533)	-0.4356 (-1.217)
year97	-0.1380 (-0.855)	-0.2806 (-1.547)	-0.3176 (-1.039)	-0.7591** (-2.190)	-0.7510** (-2.142)
year98	0.9000** (6.188)	0.7807** (4.738)	0.3476 (1.246)	-0.0483 (-0.153)	-0.0969** (-0.303)
year99	0.5807** (3.864)	0.6903** (4.066)	-1.054** (-3.842)	-1.3138** (-4.209)	-1.2845** (-4.091)
Wald-chi ²	105.43	140.47	57.75	65.11	53.43
Prob>chi ²	0.00	0.00	0.00	0.00	0.00
no. of obs.	8440	6647	1278	983	983
no. of groups	1877	1609	715	550	550

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

Table 9: Logit results for Soft Budget Constraints in Romanian firms

Estimation method: Logit model with random-effects				
Sample period: 1996-1999				
Dependent variable: Soft Budget Constraints				
	unrestricted sample		restricted sample	
variable	(1)	(2)	(3)	(4)
constant	-1.3385** (-12.976)	-1.4144** (-11.499)	-0.1235 (-0.755)	-0.0352 (-0.172)
herfindahl	0.0095 (1.047)	0.0157 (1.465)	0.0268** (2.237)	0.0154 (1.041)
import	-0.0101 (-1.621)	-0.0060 (-0.850)	-0.0222** (-2.484)	-0.0217** (-2.021)
employment	0.0001 (0.297)	0.0001 (0.424)	0.0008** (3.446)	0.0007** (2.895)
state		0.6112** (3.782)		-0.1066 (-0.592)
insiders/ cooperatives		-0.1482 (-0.521)		-0.7509** (-2.533)
foreign		-0.0466 (-0.195)		0.2223 (0.683)
municipalities		0.1798 (0.438)		-0.2161 (-0.475)
year96	-1.7392** (-11.336)	-1.9937** (-10.936)	-0.8579** (-4.059)	-0.9330** (-3.729)
year97 ¹	-1.4057** (-9.903)	-1.6349** (-9.816)	1.0851** (5.297)	1.1352** (4.788)
year99	0.2444** (2.171)	0.3762** (3.037)	0.7394** (4.044)	0.7943** (3.719)
Wald-chi ²	272.93	264.38	110.68	95.39
Prob>chi ²	0.00	0.00	0.00	0.00
no. of obs.	4657	3780	1557	1283
no. of groups	1401	1225	855	738
Notes: * = significant at 10% level, ** = significant at 5% level				
¹ : referring to year98 in regressions (3) and (4)				

Table 10: Logit results for Soft Budget Constraints in Bulgarian firms with investment-corrected measure for SBC

Estimation method: Logit model with random-effects				
Sample period: 1995-1999				
Dependent variable: Soft Budget Constraints				
	unrestricted sample		restricted sample	
variable	(1)	(2)	(3)	(4)
constant	-3.8533** (-20.822)	-4.4456** (-19.444)	0.4607* (1.726)	-0.1192 (-0.367)
herfindahl	0.0075** (2.600)	0.0083** (2.587)	0.0090** (2.187)	0.0162** (3.285)
import	-0.0011 (-1.328)	-0.0019** (-1.992)	-0.0004 (-0.368)	-0.0007 (-0.492)
employment	-0.0001 (-1.232)	-0.0001 (-0.848)	0.0002* (1.752)	0.0002** (2.128)
state		0.9934** (6.005)		0.3584 (1.521)
foreign		1.2292** (6.192)		1.3463** (4.300)
insiders		-2.5620** (-2.309)		0.7496 (0.375)
year96	-0.4589** (-2.617)	-0.4825** (-2.468)	-0.8945** (-2.916)	-0.9728** (-2.752)
year97	-0.1066 (-0.648)	-0.2400 (-1.293)	-0.2291 (-0.766)	-0.6060* (-1.771)
year98	0.8286** (5.556)	0.8259** (4.883)	0.1032 (0.383)	0.0782 (0.249)
year99	0.8698** (5.774)	1.0074** (5.865)	-0.4256 (-1.611)	-0.6042** (-1.998)
Wald-chi ²	126.96	168.80	28.28	47.53
Prob>chi ²	0.00	0.00	0.00	0.00
no. of obs.	8440	6647	1278	983
no. of groups	1887	1609	715	550
Notes: * = significant at 10% level, ** = significant at 5% level				

Table 11: Logit results for Soft Budget Constraints in Romanian firms with investment-corrected measure for SBC

Estimation method: Logit model with random-effects				
Sample period: 1996-1999				
Dependent variable: Soft Budget Constraints				
	unrestricted sample		restricted sample	
variable	(1)	(2)	(3)	(4)
constant	-3.0367** (-19.951)	-1.3396** (-10.740)	-0.9949** (-5.910)	-0.9624** (-4.644)
herfindahl	0.0063 (0.689)	0.0112 (1.034)	0.0290** (2.378)	0.0165 (1.091)
import	-0.0101 (-1.606)	-0.0063 (-0.889)	-0.0223** (-2.492)	-0.0214** (-1.996)
employment	0.0002* (1.945)	0.0002** (2.142)	0.0007** (2.701)	0.0006** (2.531)
state		0.5824** (3.576)		-0.1026 (-0.570)
insiders/ cooperatives		-0.2526 (-0.879)		-0.7373** (-2.482)
foreign		0.0608 (0.248)		0.2097 (0.630)
municipalities		0.0974 (0.235)		-0.2063 (-0.454)
market shares	-0.0170** (-3.532)	-0.0191** (-3.520)	0.0101 (1.542)	0.0035 (0.496)
year97	0.3377** (2.097)	-1.6324** (-9.753)	0.8551** (4.048)	0.9201** (3.677)
year98 ¹	1.7495** (11.309)	-1.9834** (-10.844)	1.9377** (9.053)	2.051** (8.222)
year99	2.0042** (13.616)	0.3786** (3.034)	1.5913** (8.334)	1.7150** (7.741)
Wald-chi ²	278.70	268.55	112.07	94.86
Prob>chi ²	0.00	0.00	0.00	0.00
no. of obs.	4650	3777	1553	1281
no. of groups	1401	1225	852	736
Notes: * = significant at 10% level, **= significant at 5% level				
¹ : referring to year96 in regression (2)				

Table 12: Logit results for Soft Budget Constraints in Bulgarian firms with investment-corrected measure for SBC and market shares

Estimation method: Logit model with random-effects				
Sample period: 1996-1999				
Dependent variable: Soft Budget Constraints				
	unrestricted sample		restricted sample	
variable	(1)	(2)	(3)	(4)
constant	-2.8559** (-18.614)	-3.0830** (-15.876)	-0.9926** (-5.871)	-0.0240 (-0.116)
herfindahl	0.0030 (0.332)	0.0086 (0.799)	0.0289** (2.354)	0.0157 (1.020)
import	-0.0116* (-1.845)	-0.0079 (-1.107)	-0.0222** (-2.494)	-0.0217** (-2.018)
employment	0.0002* (1.759)	0.0002* (1.689)	0.0007** (2.577)	0.0007** (2.578)
state		0.5347** (3.268)		-0.1060 (-0.588)
insiders/ cooperatives		-0.4035 (-1.395)		-0.7614** (-2.544)
foreign		0.1728 (0.701)		0.2434 (0.724)
municipalities		-0.0393 (-0.095)		-0.2239 (-0.491)
market shares	-0.0651** (-5.840)	-0.0693** (-5.634)	0.0078 (0.485)	-0.0095 (0.532)
squared market shares	0.0007** (4.970)	0.0007** (4.725)	0.0001 (0.149)	0.0002 (0.783)
year97 ¹	0.3219** (1.994)	0.3295* (1.715)	0.8553** (4.048)	-0.9172** (-3.662)
year98	1.7504** (11.303)	1.9644** (10.733)	1.9384** (9.051)	1.1332** (4.776)
year99	1.9851** (13.479)	2.3179** (13.133)	1.5922** (8.331)	0.7971** (3.729)
Wald-chi ²	291.04	277.09	111.94	94.73
Prob>chi ²	0.00	0.00	0.00	0.00
no. of obs.	4650	3777	1553	1281
no. of groups	1401	1225	852	736
Notes: * = significant at 10% level, ** = significant at 5% level				
¹ : referring to year96 in regression (4)				

Table 13: Logit results for Soft Budget Constraints in Bulgarian firms with investment-corrected measure for SBC and market shares (levels and squared)

Estimation method: Logit model with random-effects				
Sample period: 1995-1999				
Dependent variable: Soft Budget Constraints				
	unrestricted sample		restricted sample	
variable	(1)	(2)	(3)	(4)
constant	-3.8544** (-20.527)	-4.4495** (-19.297)	0.5689** (2.115)	-0.0724 (-0.219)
herfindahl	0.0072** (2.476)	0.0086** (2.632)	0.0077* (1.903)	0.0159** (3.202)
import	-0.0011 (-1.286)	-0.0019* (-1.929)	-0.0007 (-0.601)	-0.0008 (-0.588)
employment	-0.0001 (-0.505)	0.0001 (0.122)	0.0001 (1.341)	0.0002* (1.756)
state		0.9492** (5.690)		0.3715 (1.557)
foreign		1.2251** (6.165)		1.3368** (4.263)
insiders		-2.4746** (-2.228)		0.7746 (0.388)
market shares	-0.0303** (-2.547)	-0.0512** (-2.819)	0.0602* (1.713)	0.0650* (1.652)
year96	-0.4430** (-2.499)	-0.4526** (-2.293)	-0.9519** (-3.079)	-1.0518** (-2.937)
year97	-0.0503 (-0.303)	-0.1747 (-0.9390)	-0.2990 (-0.993)	-0.6911** (-1.989)
year98	0.8658** (5.715)	0.8971** (5.206)	0.0321 (0.117)	0.0141 (0.044)
year99	0.9146** (5.982)	1.0689** (6.138)	-0.4828* (-1.811)	-0.6670** (-2.171)
Wald-chi ²	127.28	169.69	30.63	49.90
Prob>chi ²	0.00	0.00	0.00	0.00
no. of obs.	8253	6563	1234	971
no. of groups	1831	1586	692	541
Notes: * = significant at 10% level, ** = significant at 5% level				

Table 14: Logit results for Soft Budget Constraints in Romanian firms with investment-corrected measure for SBC and market shares

Estimation method: Logit model with random-effects				
Sample period: 1995-1999				
Dependent variable: Soft Budget Constraints				
variable	unrestricted sample		restricted sample	
	(1)	(2)	(3)	(4)
constant	-3.8544** (-20.527)	-4.4496** (-19.297)	0.5702** (2.119)	-0.0710 (-0.215)
herfindahl	0.0072** (2.477)	0.0086** (2.632)	0.0077* (1.891)	0.0158** (3.175)
import	-0.0011 (-1.286)	-0.0019* (-1.929)	-0.0007 (-0.609)	-0.0008 (-0.591)
employment	-0.0001 (-0.504)	0.0001 (0.122)	0.0001 (1.297)	0.0002* (1.711)
state		0.992** (5.690)		0.3716 (1.557)
foreign		1.225** (6.165)		1.3369** (4.261)
insiders		-2.4746** (-2.228)		0.7771 (0.389)
market shares	-0.0304** (-2.550)	-0.0512** (-2.820)	0.0677 (1.374)	0.0750 (0.899)
squared market shares	0.0001** (2.344)	0.0001** (2.357)	-0.0002 (-0.237)	-0.0004 (-0.137)
year96	-0.4430** (-2.499)	-0.4526** (-2.293)	-0.9524** (-3.081)	-1.0511** (-2.934)
year97	-0.0503 (-0.303)	-0.1747 (-0.930)	-0.3018 (-1.001)	-0.6949** (-1.993)
year98	0.8659** (5.716)	0.8971** (5.206)	0.0284 (0.104)	0.0090 (0.028)
year99	0.9146 (5.983)	1.0690** (6.138)	-0.4849* (-1.817)	-0.6698** (-2.174)
Wald-chi ²	127.30	169.70	30.99	49.88
Prob>chi ²	0.00	0.00	0.00	0.00
no. of obs.	8253	6563	1234	971
no. of groups	1831	1586	692	541

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

Table 15: Logit results for Soft Budget Constraints in Romanian firms with investment-corrected measure for SBC and market shares (levels and squared)

Estimation method: Logit model with random-effects				
Sample period: 1995-1999				
Dependent variable: Soft Budget Constraints				
variable	unrestricted sample		restricted sample	
	(1)	(2)	(3)	(4)
constant	-3.6476** (-22.144)	-4.2724** (-20.171)	0.7261** (2.913)	0.2751 (0.881)
herfindahl	0.0108 (1.437)	0.0095 (1.048)	0.0074 (0.630)	0.0073 (0.539)
import	-0.0025* (-1.738)	-0.0038** (-2.332)	-0.0032 (-1.220)	-0.0037 (-1.246)
employment	-0.0001 (-0.524)	0.0001 (0.083)	0.0002** (2.559)	0.0004** (3.174)
state		1.0343** (6.335)		0.4685** (1.965)
foreign		1.2284** (6.150)		1.3060** (4.118)
insiders		-2.6011** (-2.335)		0.7636 (0.365)
year96	-0.4839** (-2.718)	-0.5000** (-2.519)	-0.9246** (-2.952)	-0.9704** (-2.676)
year97	-0.1314 (-0.798)	-0.2689 (-1.443)	-0.2560 (-0.850)	-0.6332* (-1.832)
year98	0.8026** (5.399)	0.7969** (4.717)	0.0838 (0.309)	0.0371 (0.117)
year99	0.8190** (5.482)	0.9589** (5.599)	-0.4500* (-1.696)	-0.6077** (-1.990)
Wald-chi ²	124.66	165.82	25.60	40.67
Prob>chi ²	0.00	0.00	0.00	0.00
no. of obs.	8439	6646	1278	983
no. of groups	1876	1608	715	550
Notes: * = significant at 10% level, ** = significant at 5% level				

Table 16: Logit results for Soft Budget Constraints in Romanian firms (using differences and modified measure for SBC)

NACE-code	Description
15	Manufacture of food products and beverages
16	Manufacture of tobacco products
17	Manufacture of textiles
18	Manufacture of wearing apparel/dressing and dyeing of fur
19	Tanning and dressing of leather/manufacture of luggage
20	Manufacture of wood and of products and cork
21	Manufacture of pulp, paper and paper products
22	Publishing, printing and reproduction of recorded media
23	Manufacture of coke, refined petroleum products
24	Manufacture of chemicals and chemical products
25	Manufacture of rubber and plastic products
26	Manufacture of other non-metallic mineral products
27	Manufacture of basic metals
28	Manufacture of fabricated metal products
29	Manufacture of machinery and equipment
30	Manufacture of office machinery and computers
31	Manufacture of electrical machinery and apparatus
32	Manufacture of radio, television
33	Manufacture of medical, precision instruments
34	Manufacture of motor vehicles, trailers and semi-trailers
35	Manufacture of other transport equipment
36	Manufacture of furniture
37	Recycling

Table 17: Description of Nace-codes (2-digit level)

nace-code	Bulgaria		Romania	
	number of firms	in %	number of firms	in %
15	296	19.27	463	20.19
16	26	1.69	1	0.04
17	154	10.03	227	9.80
18	186	12.11	245	10.68
19	51	3.32	113	4.93
20	32	2.08	111	4.84
21	26	1.69	30	1.31
22	34	2.21	91	3.97
23	4	0.26	11	0.48
24	71	4.62	79	3.44
25	35	2.28	66	2.88
26	79	5.14	122	5.32
27	48	3.12	63	2.75
28	92	5.99	149	6.50
29	152	9.90	168	7.11
30	6	0.39	11	0.48
31	66	4.30	47	2.05
32	27	1.76	21	0.91
33	20	1.30	26	1.13
34	21	1.37	51	2.22
35	23	1.50	38	1.65
36	82	5.34	136	5.93
37	5	0.33	24	1.05
Total	1536	100	2293	100
Source: own calculations using AMADEUS Data				

Table 18: Distribution of firms by industries in the sample

year	Bulgaria		Romania	
	firms with employment > 400	in %	firms with employment > 1000	in %
1994	292	31.8	1185	75.1
1995	353	27.0	1188	80.5
1996	323	24.0	970	56.9
1997	288	21.0	896	50.7
1998	277	19.0	730	38.7
1999	241	17.0	661	34.8
Source: own calculations using AMADEUS Data				

Table 19: Big firms in the sample

year	Bulgaria	
	firms with losses and employment > 400 in the sample of big firms (in %)	firms with losses and employment < 400 in the sample of small firms (in %)
1995	14.76	24.40
1996	7.49	27.40
1997	8.26	24.17
1998	31.58	38.10
1999	18.18	48.75

Source: own calculations using AMADEUS Data

Table 20: Performance of big and small firms in Bulgaria

year	Romania	
	firms with losses and employment > 1000 in the sample of big firms (in %)	firms with losses and employment < 1000 in the sample of small firms (in %)
1995	3.96	12.05
1996	3.09	11.29
1997	3.79	11.95
1998	7.80	20.41
1999	7.26	24.11

Source: own calculations using AMADEUS Data

Table 21: Performance of big and small firms in Romania

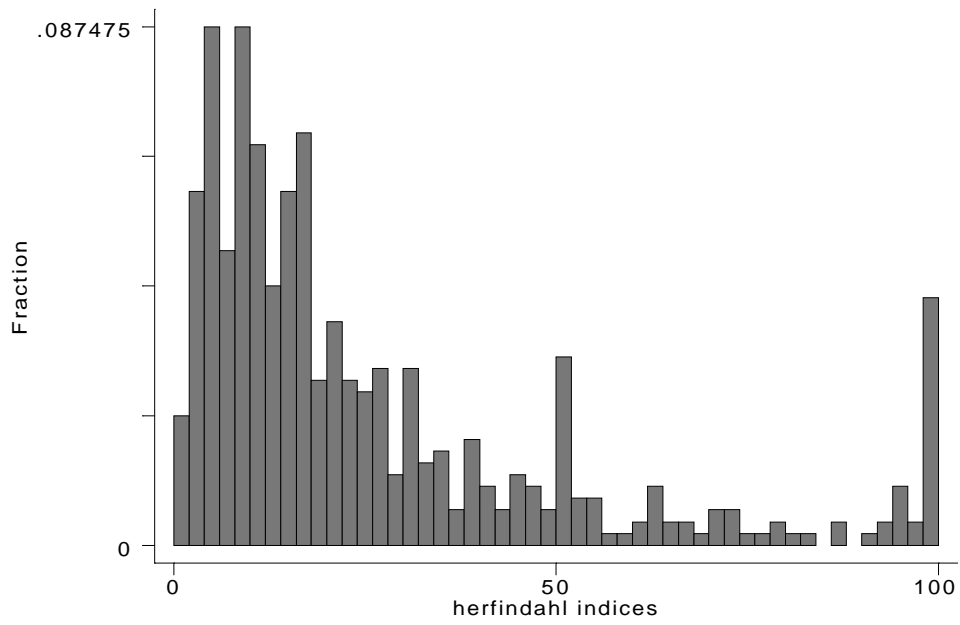


Figure 1: Herfindahl indices, Bulgaria

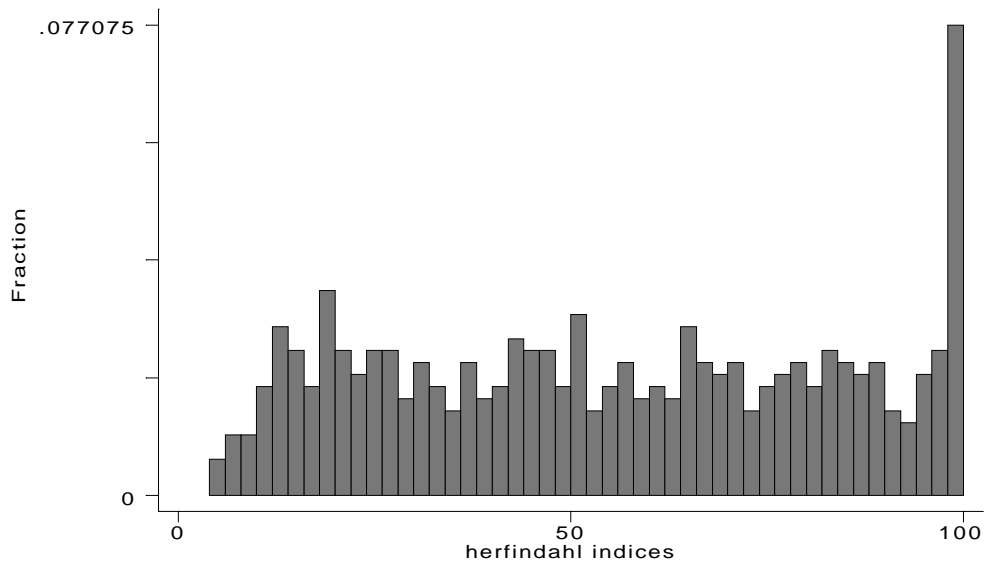


Figure 2: Herfindahl indices, Romania

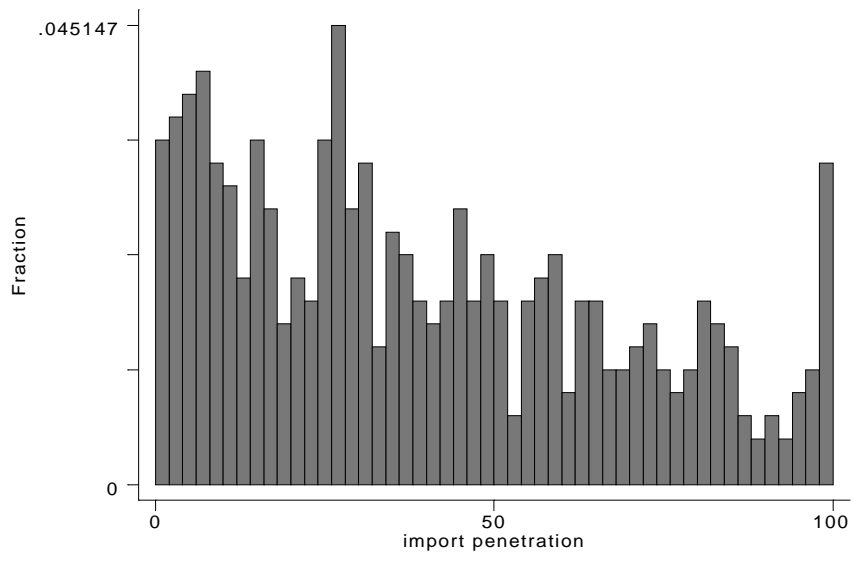


Figure 3: Import penetration, Bulgaria

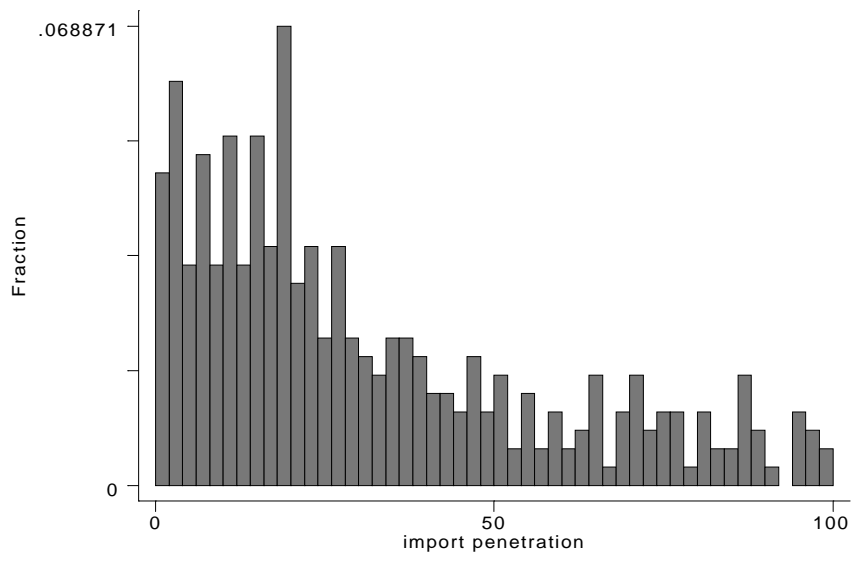


Figure 4: Import penetration, Romania

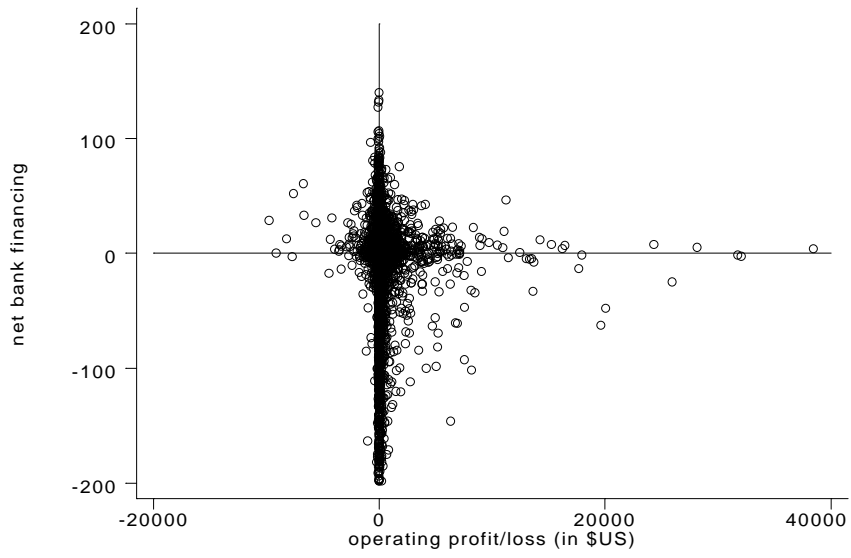


Figure 5: Net bank financing, Bulgaria

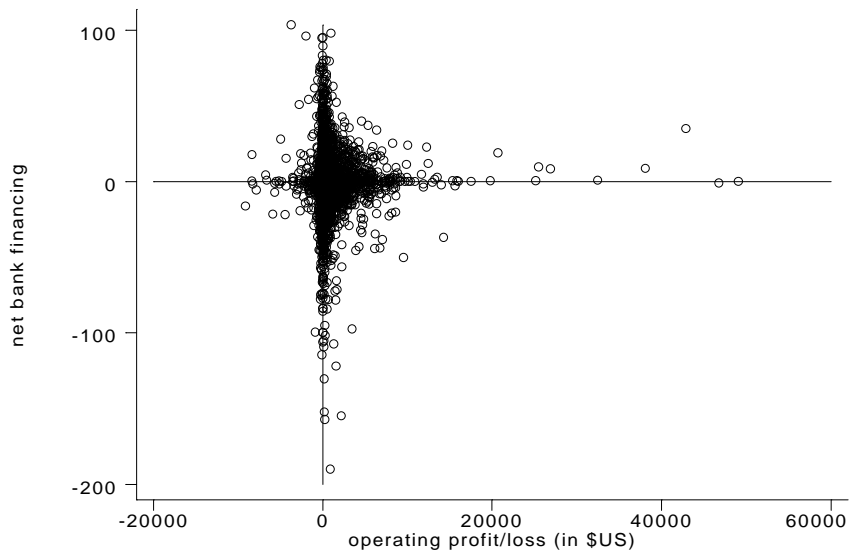


Figure 6: Net bank financing, Romania

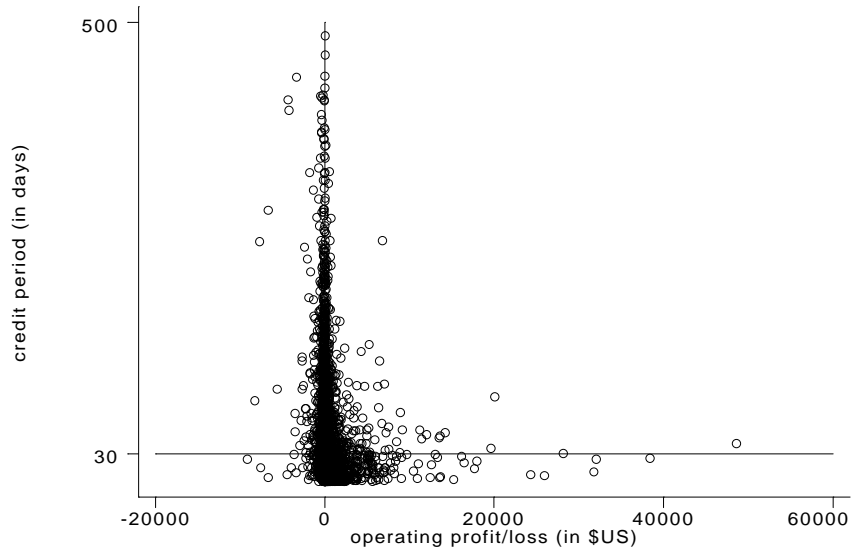


Figure 7: Credit Period, Bulgaria

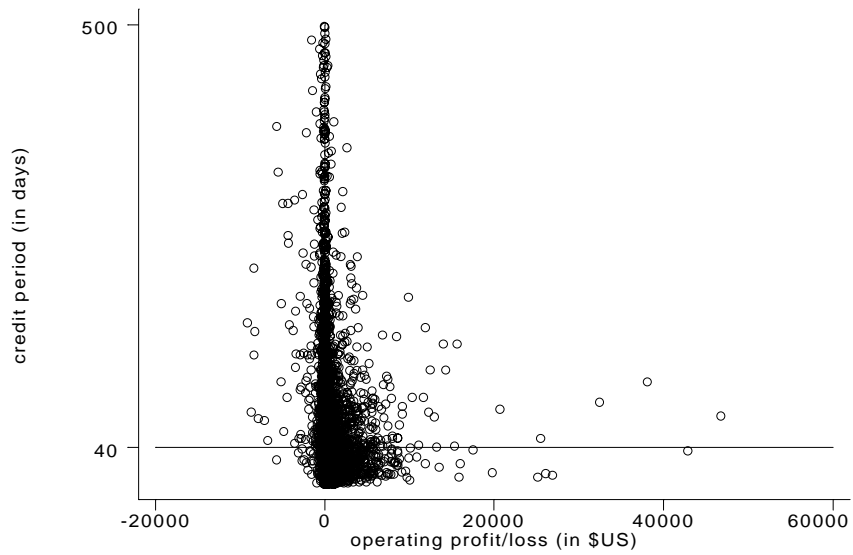


Figure 8: Credit Period, Romania

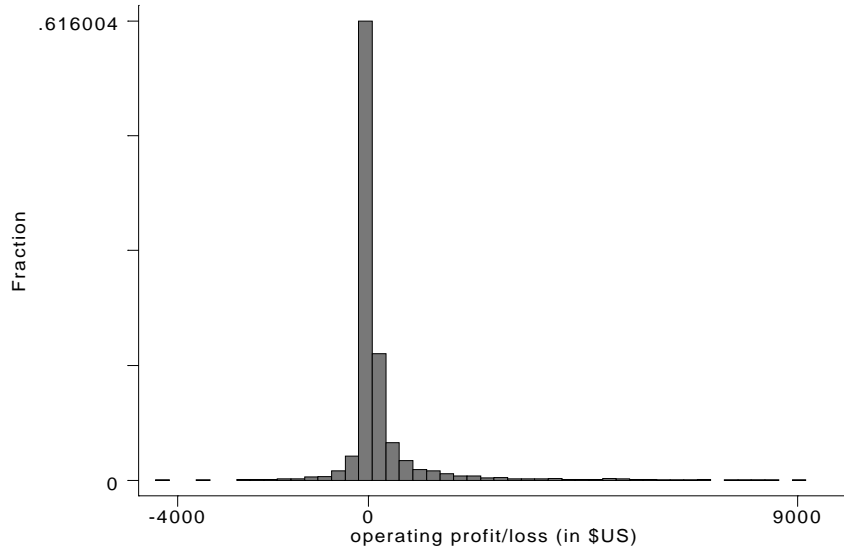


Figure 9: Operating Profit/Loss, Bulgaria

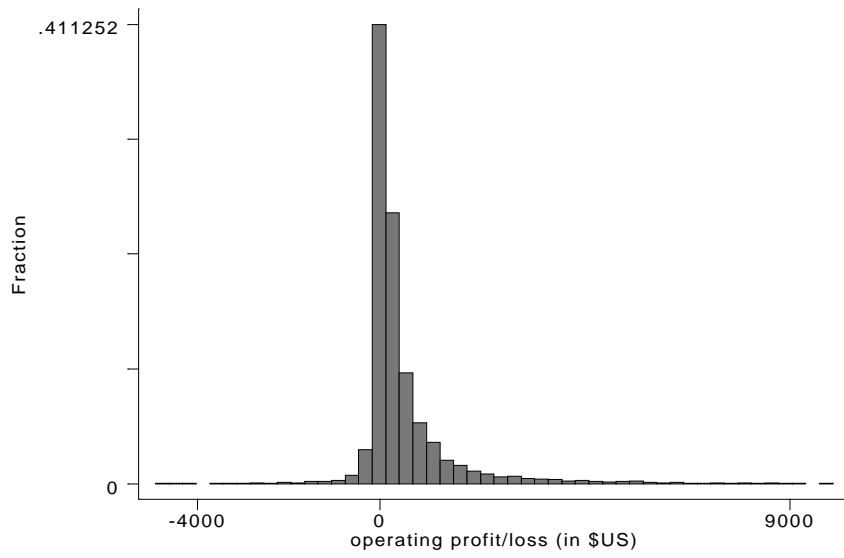


Figure 10: Operating Profit/Loss, Romania