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**How Costly are (Agricultural) Investments during Economic Transition?  
A Critical Literature Appraisal**

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**Abstract**

This paper critically examines a large strand of empirical literature with regard to (agricultural) finance and investment in economic transition. Our main contribution is to summarize empirical evidence for the co-existence of credit constraints and soft budget constraints (SBC) and to highlight a conceptual framework for their appropriate classification. This is of particular interest since credit constraints and SBC have really different economic effects, and the lack of discrimination between these forms of capital market imperfections may lead to wrong (agricultural) policy implications. Apparently, credit constraints in transitional economies became more important than soft budget constraints for firms' growth and structural change.

**Keywords:** investment, transition, credit constraints, soft budget constraints

**JEL classification:** O16, Q14, P23

**1. Basic theoretical principles of investment and financing**

Empirical evidence has broadly proved that capital investment is a driving force of firms' growth and structural change. A particularly high need of structural development can be observed during economic transition as the old capital stock inherited from the socialist times must be replaced by the new and modern one. Thereby own funds are often insufficient across firms, and external capital in form of credits becomes a crucial source of finance. However, during the transition process, banks are often undercapitalised, a comparably low number of loan contracts exist, and non-banking financial institutions are typically missing (DOBRYNSKY 2007). When the supply of external capital does not meet the high capital demand potential investments may be hindered.

There exist several economic models designed to tackle the investment process. The neoclassical investment theory considers a firm that maximises its discounted profits over an

infinite time horizon, when considering only the opportunity (user) cost of capital. Thereby perfect capital market conditions are assumed, so that firms' capital structure does not have any significant effects on investment decisions.

In the last decades new insights into investment theory centred around two themes: the effects of uncertainty and irreversibility on investment and the role of capital market imperfections. The main insight from the first literature is that a firm, being uncertain about the future and knowing that it might be hard to resell capital, may benefit from waiting. The second strand of the literature is the group of new institutional theories dealing with the impact of capital market imperfections and agency problems on investment. If capital markets are perfect, the financial structure does not affect the costs of investing. Otherwise, if a gap in costs of external and internal capital exists, firms prefer to finance investments by internal funds (pecking order of finance).

Within the new institutional approach, two contradictory concepts can be found with regard to how investment and financing opportunities are related, credit rationing theory and soft budget constraints (SBC) theory. Credit rationing theory (STIGLITZ and WEISS 1981) focuses on the presence of information asymmetries in the lender-borrower relationship, when firms' demand for external funds of capital is confronted with a small supply. Credit rationed firms are not able to borrow the desired amount of capital despite their willingness to pay the current interest rate. Besides pure credit rationing, redlining exists, meaning that some categories of borrowers are totally excluded from the credit market as those face too high (transaction) costs of borrowing. Credit rationing (or credit constraints in a wide sense) may be weakened via monitoring and screening activities of banks. Obviously, those additional efforts raise the price for loans and further deepen the gap between external and internal funds<sup>1</sup>.

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<sup>1</sup> See PETRICK (2005) for empirical applications of credit rationing theory and capital market imperfections.

The concept of soft budget constraints, SBC (KORNAI et al. 2003), analyses state bailouts for unprofitable enterprises with special interventions designed to ensure the survival of an enterprise, or a whole economic sector that would otherwise cease to exist. Evidence of SBC often occurs when the national governments aim to soften economic and social conditions during the transition process. In developed economies, soft budget constraints may result from asymmetric information and lack of commitment enabling the creditors to refinance poor investment projects. In particular, large creditors such as Central bank are able to refinance those projects after the initial investment costs are sunk.

When investment and finance are not independent, the investment expenditure of firms may be subject to liquidity constraints. However, at the microeconomic level it is hard to get a grip on the determinants of investment. Liquidity is typically a variable that performs well although it should not according to the traditional (neoclassical) investment models. Starting from these considerations FAZZARI et al. (1988) augment a traditional investment demand equation by incorporating a measure of cash flow. Evidence of a positive correlation between investment and cash flow would lead to the rejection of the complete markets assumption.

Usually, a negative or non-significant cash flow coefficient is interpreted in favour of the perfect capital market hypothesis. In a transitional context, a zero or non-significant cash flow sensitivity is rather a result of SBC. A discrepancy between the forms of capital market imperfections is of particular importance since those affect investment behaviour in a different way. Financially constrained (profitable) firms have a limited access to bank loans and thus cannot realise profitable investment projects, whilst SBC firms invest even though they are unprofitable. When SBC firms are analysed jointly with financially constrained firms, the impact of financial constraints on investment may be misunderstood, and thus the problem of classification arises. Further, we try to respond to this question when looking at a large strand of the empirical financial literature and discussing several classification criteria for credit constraints and SBC.

## **2. Financing-investment relationship in the empirical literature**

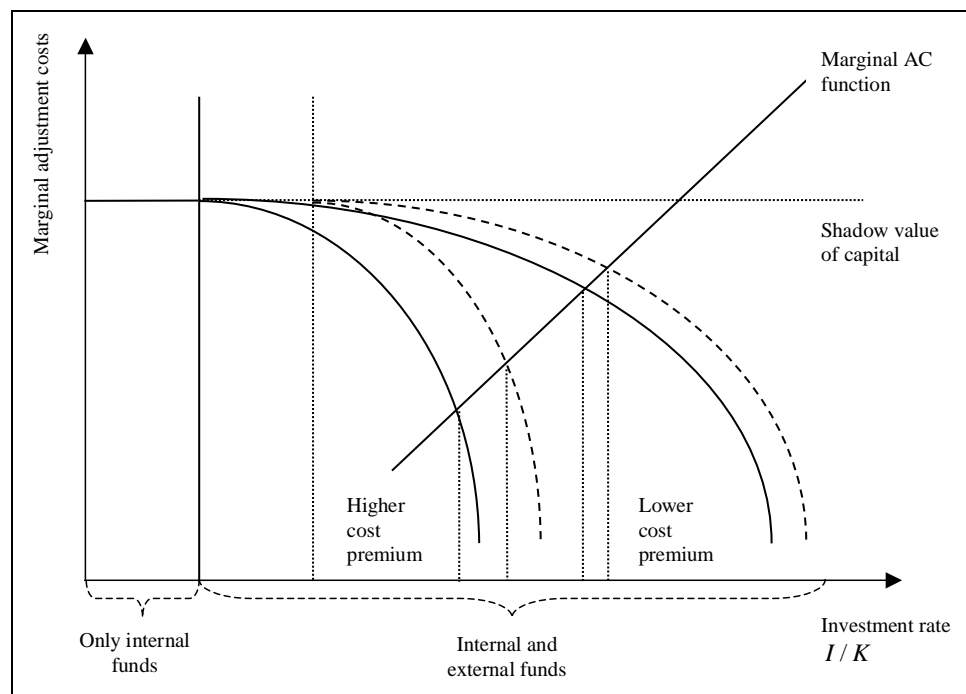
### **2.1. Modelling investment under financial regimes**

As mentioned above, accounting for the financing-investment relationship in a simple linear fashion of the investment demand model is obviously inadequate because of the potentially different financial regimes during the observed time period and across analysed units. Thereby the choice of the sample separation criterion may be problematic. A difficulty arises from the fact that it is almost impossible to identify the exact years during which a firm is constrained. In other words, it is difficult to differentiate between the firm-specific effects on investment and the effects of financial constraints (KAPLAN and ZINGALES 1997), which requires determining exogenously the premium on external finance, and furthermore, whether a firm is confronted with more or less severe market imperfections.

Firms may be debt-constrained in one period but unconstrained in another, with the firms' own activity affecting the likelihood of being in one regime or the other (VIJVERBERG 2004). Usually evidence of credit rationing cannot be directly observed in the empirical data because firms do not report whether they faced a borrowing limit. Thus, the empirical model may integrate credit regimes by inferring credit conditions from firm-year behaviour as revealed by the data. For example, WHITED (1992) bases the sample partition on the measure of firms' financial distress. BOND and MEGHIR (1994) use the indicator of the hierarchy of finance (dividend payment behaviour), whilst LAGERQUIST and OLSON (2001) incorporate the differences in probability of financial constraints through an additional equation for finance. A remedy for separating the impact of the financial constraints is to use the a priori indicator for the availability of external funds, i.e. the financial status, as a time-specific dummy variable. This variable equals one when no new borrowing is present (constrained financial regime), and is zero otherwise (unconstrained financial regime).

The choice of the sample separation criteria in the empirical literature is often based on the assumption that conditional cash flow-investment sensitivity increases monotonically with the cost premium for external finance in a financially constrained regime. In the BOND and SÖDERBOM (2006) model with quadratic adjustment cost of capital and strictly increasing costs of new equity, a simple monotonic relationship between the conditional sensitivity of investment, windfall fluctuations in cash flow, and the severity of the financing constraint can be shown (see Figure 1). This is reflected in the slope of the cost schedule for external funds, for otherwise identical firm in the financially constrained regime. If one compares firms with the same adjustment cost schedule, supply of internal funds and shadow value of capital, it can be found no case in which the effect on investment is strictly greater for the firm with the lower cost premium.

Figure 1: Increasing cost premium of investment finance



Source: BOND and SÖDERBOM (2006)

## 2.2. Empirical evidence from economic transition

It is usually assumed that credit rationing/credit constraints (independent from future profitability) introduce a distorting bias against certain firms. In transition countries, this bias might work in a specific direction (MAUREL 2001). The loss makers might be more largely provided with cheap credit and might be more able to raise credit despite their losses. That is, the elasticity of investment to cash flow may be considered as reflecting the process of budget constraints' hardening.

In fact, credit rationing and SBC often occur simultaneously in economic transition. This has an important practical consequence for the a priori grouping of financially constrained (rationed) and unconstrained firms. The degree of softness of the budget constraint is more relevant for discriminating firms than traditional variables such as size, number of employees, or debt burden<sup>2</sup>, which might fail in detecting and describing the market imperfection in a transition economy. For instance, the intuition of the most studies for Western economies is that companies with a relatively large amount of debt are more likely to face liquidity constraints, whatever their profitability is. In certain transition countries, indebtedness is more proxy for the degree of softness of the budget constraint than for the availability of internal funds.

In this decade several authors dealt with empirical analysis of financial constraints in economic transition. BRATKOWSKI et al. (2000) give empirical evidence that profitable firms in the Czech Republic, Hungary and Poland rely mostly on their own capital for financing investment expenditures. Furthermore, empirical findings for the Central and Eastern European (CEE) transition countries show that highly profitable firms 'automatically' lower their leverage (DE HAAS and PEETERS 2006). Only when the costs of deviation from the optimal (target) capital structure become large enough, firms start to increase their debt level.

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<sup>2</sup> See an extensive review in HUBBARD (1998).



This finding coincide with another result that capital adjustment speed among the firms is relatively low if compared to the more developed Western economies.

Above all, it is of primary interest to look at the interpretation of financial indicators with regard to firms' investment. E.g. LIZAL and SVEJNAR (2002) clarify the investment sensitivity to financial constraints in the Czech industry (see Table 1 for details). A positive relationship between financial measures and investment is interpreted in favour of credit rationing. Under perfect capital markets this coefficient should be zero or non-significant, but in a transition economy, zero or negative coefficient signals that the firms' access to bank loans does not correlate with their efficiency (i.e. SBC are possible). On the contrary, HANOUSEK and FILER (2004) interpret the positive coefficient of the financing-investment relationship as a sign of attractive investment alternatives. Firms with low profits, which invest on average more, are classified as 'not financially unconstrained'. As the latter finding may simply point out a need of additional structural transformations, the SBC hypothesis is rejected in this study.

To our knowledge, research on the financing-investment relationship related to the lagged transition economies of the former Soviet Union (CIS) is scarcer if compared to the CEE countries. E.g. VOLCHKOVA (2001) analyses financial constraints between the two samples of the Russian industrial enterprises, unregistered financial-industrial groups and non-group subsets. The groups demonstrate a stronger dependency of investment decisions on financing if compared with independent (i.e. non-group) enterprises. In the case of Russia where capital markets are still underdeveloped, this dependency reveals the evidence of stronger control over investment in firm groups, or, in other words, better contract enforcement. Similarly, PAVEL et al. (2004) investigates the financing-investment relationship in the Ukrainian economy, assuming that in several periods, firms' financial constraints may occur. Thereby a higher average capital productivity of the smaller and younger industry firms facing liquidity constraints can be revealed. Anyhow, this productivity does not suffice to realize the growth potential under the financial market imperfections in transition.

Table 1: Financial constraints and investment in transition economies: Empirical applications

Authors / Year	Theory	Endogenous variables	Exogenous variables	Sector / Land / Data	Hypothesis / Results
PETRICK (2004a)	CR	Investment value	Credit volume Capital stock	Agriculture Poland (1997-1999)	Subsidised credits are important for farms' investment decisions
RIZOV (2004a)	SBC CR	Dummy for credit constraints Profit	Capital assets Current assets Leverage Debt	Industry Bulgaria (1997-1999)	Unsatisfactory capital productivity of financially constrained firms proved Evidence of SBC noticed
RIZOV (2004b)	SBC CR	Investment rate	CF-capital ratio Output-capital ratio Leverage	Industry Romania (1995-1999)	SBC confirmed Firms with unconstrained credit access reveal a weaker financial sensitivity of investment
COLOMBO and STANCA (2006)	SBC	Investment rate	Output-capital ratio CF-capital ratio	Industry Hungary (1989-1999)	SBC phenomenon is more typical for large enterprises, particularly for state owned firms
HUTCHINSON and XAVIER (2006)	SBC CR	Growth of total assets	Growth of real turnover CF Capital stock level	Industry Belgium Slovenia (1993-2001)	Greater role of CF for investment in Slovenia than in Belgium Larger firms are less financially constrained
DOBRINSKY (2007)	CR	Investment rate	Output User cost of capital Debt Capital inflows Gross national savings	National economy CEE & CIS countries (1995-2004)	Strong positive impact of the output level and bank credits on business investment in the CEE countries Investment in the CIS is more sensitive to the availability of internal finance

Notes: CR - Credit Rationing; SBC - Soft Budget Constraints; CF - Cash Flow; CEE - Central and Eastern Europe; CIS - Commonwealth of Independent States.

Source: Own presentation

A number of studies analyse the impact of financial constraints on investment in the agricultural sector of post-socialist countries. However, those studies focus on either credit rationing/credit constraints or SBC and do not consider both phenomena in one unifying empirical model. Among others, SARRIS et al. (2004) prove the hypothesis about financial constraints across agricultural enterprises in the CEE and show that these constraints are more severe for smaller farms. PETRICK (2004b) gives empirical evidence of credit rationing in Polish agriculture, which is determined by the lack of collateral. Whilst state-reduced interest rates do not change significantly farms' investment, the amount of subsidised credits appears to be important for farms' investment decisions. LATRUFFE (2005) further confirms the hypothesis about the presence of imperfect rural capital market in Poland. This imperfectness is put down to the high borrowing costs of new loans as well as credit rationing. Larger farms, which are better performers in terms of capital productivity and investment, seem to be more affected by market imperfections than smaller farms. They face stronger financial constraints having on average less collateral needed for receiving credits.

WIEBUSCH (2005) when analysing credit access determinants in Poland and Slovak Republic confirms total credit rationing only for a small number of analysed farms in both countries, whilst many other farms are partially rationed due to high transaction costs. Furthermore, BOKUSHEVA et al. (2007) show for Russian farms that deviations from the optimal investment path are due to the limited liability of internal funds and permanent sales shocks.

### **2.3. Classification of capital market imperfections**

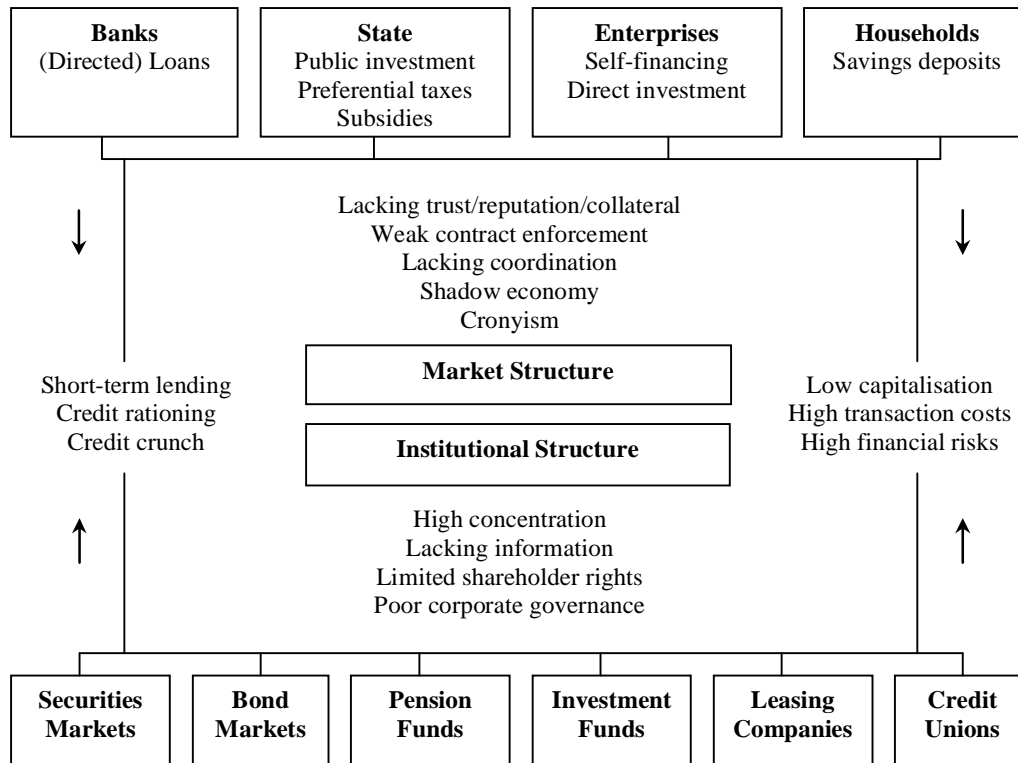
The simultaneous presence of both credit constraints and soft budget constraints can be investigated when using one unifying model of firms' investment demand. However, a choice of a unique sample separation criterion is questionable. E.g. RIZOV (2004b) divides firms into the different financial regimes ('constrained' and 'unconstrained') applying two sample selection criteria. The first criterion is that firms with positive borrowing during the two

consecutive years hold as ‘unconstrained’, and the remainder are ‘constrained’ firms. The second sample selection criterion is that firms receiving credits and non-negative profits are assumed to be ‘unconstrained’. Remaining firms are then claimed as financially ‘constrained’. Naturally, those two simple selection criteria are not sensitive enough to distinguish exactly between financial regimes. Admittedly, since the capital stock replacement in transition is far beyond the optimal level of investment, all enterprises may face an under-investment problem. Moreover, many viable (profitable) firms with a comparably strong financial discipline may face more severe financial obstacles to investment, whilst some other firms, when revealing weaker financial discipline, may enjoy preferential financial treatment by banks.

An alternative *a priori* sample separation criterion in ZINYCH and ODENING (2008) is that ‘unconstrained’ agricultural enterprises in Ukraine borrow even after being classified as non-profitable during two consecutive years. Obviously, this approach does not trace back to the exact factors that cause binding liquidity restrictions of farms and may be thus considered as ad hoc. With respect to farms being constrained, when there is no access to credit, they must exhibit demand for credit. Similarly, farms may be due to a soft financial treatment after certain macroeconomic shocks; the latter cannot be considered as pure SBC.

An interesting finding for an empirical researcher is however that the presence of credit constraints in the Ukrainian agricultural sector is more important than SBC. In a transitional context, GUGLER and PEEV (2007) also show that the intensity of SBC has been decreasing over the past years. Simultaneously to a declining effect of SBC in economic transition, the absence of appropriate credit ratings and firms’ credit histories for creditworthiness assessment makes it high-risky for banks to engage both in the ‘real sector’ and in the long-term crediting (Figure 2).

Figure 2: Complex financial interdependencies in economic transition



Source: Own presentation

### 3. Outlook and policy implications

Empirical evidence proves that the appropriate sample separation is an important factor when explaining investment behaviour with the different level of financial constraints. A big challenge for future research on investment and finance in transition economies is to examine carefully sample separation criteria under specific structural, institutional and regional conditions. A reason behind is that in one case, a certain criterion for credit constraints may perform as theoretically assumed. In another case, it may work in the opposite direction (i.e. signifying SBC) when applied for a specific country or a sector lagging behind in terms of economic reforms. Therefore, a general conclusion about the costs of (agricultural) investment in transition may be really mutable.

From the empirical findings summarised above several (agricultural) policy implications can be derived. With respect to SBC and particularly in the CIS countries, it is often argued that non-viable enterprises still play the role of a social buffer under lacking employment alternatives. Due to this reason, a liquidation of those enterprises is usually not supported by the government. However, the SBC hypothesis can be only partly proved by the empirical data, and furthermore the role of soft budget constraints is continuously declining over the transition period. So it is really questionable whether hardening of SBC would really lead to immense social problems. We thus plead for implementation of a bankruptcy law and/or for continuous take-overs of SBC firms.

Furthermore, different starting points can be noted with regard to how (real) credit constraints can be overcome. At the firm level, improved creditability is of particular importance. This implies a need of plausible business (investment) plans to be submitted to the banks, fair accounting standards and thus a new qualitative level of firm's management for their implementation. In credit rationing equilibrium, banks when sorting among potential borrowers do not implicitly choose those loans with the highest total returns; the latter implies welfare losses. Inversely, when credit is restricted, not necessarily the investment projects with the lowest return are terminated. Therefore, at the banking level, an efficient rating system such as that of Western European countries must be developed to facilitate the selection of viable borrowers during the credit approval process.

Other sources of external finance are direct investment and vertical integration, which may support viable enterprises with temporary financial constraints, but may also facilitate 'soft' takeovers of financially weak firms. For all that, direct investments are often hindered during economic transition because of substantial price fluctuations on input and output markets, institutional and legal loopholes, complicated bureaucratic procedures etc. In the agrifood sector, there exists potential danger in terms of imperfect competition and unequal distribution of bargaining power in the supply chain. An important issue for public policy in this context is

stimulating and monitoring vertical integration within the supply network with respect to the disadvantaged participants, which are mainly agricultural producers. The latter can be done by providing market information and product quality standards to farms, assisting farm producer organisations in lobbying their interests, but also by pursuing strong competition policy.

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