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LEVERAGE AND FOREIGN OWNERSHIP IN HUNGARY

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Contents

Abstract

In this study enterprise leverage in Hungary is analysed with particular emphasis on the relationship between foreign equity investment and leverage. We examine the hypothesis according to which attracting foreign equity capital relatively early in the transition process might have resulted in relaxing the borrowing constraint for enterprises. The regression analysis reported shows support for this hypothesis. There exist indications that some progress towards the „equilibrium" financing configuration has taken place. Also we have been able to reproduce some previous results of the literature concerning leverage in general. We compare the determinants of leverage in Hungary with those in industrialised and other transition economies, and find some interesting differences. A curious finding is that sectoral leverage levels have not followed industrial country patterns so far.

1. Introduction

The literature on capital structure has both a theoretical and an empirical side. An excellent survey of the literature can be found in Harris-Raviv (1991) whose goal was a summary of both aspects of the literature as it existed at the beginning of the 1990s. Theoretical progress made since the famous irrelevance theorem of Modigliani and Miller has been substantial. Perusing Harris-Raviv (1991) one can find a number of general principles that have been tried repeatedly to analyse certain aspects of enterprise financing. Still the reader has the impression that there was very little consensus in the area of theoretical predictions, and as long as important hypotheses are concerned different models arrived at opposite conclusions in practically every case. The incorporation of taxes, asymmetric information or game theoretical considerations can take on a bewildering variety, and focusing on different features of the same problem might very easily lead to opposite conclusions. This state of affairs might not bother those who believe that economics is after all an empirical science where, though a priori different theories can be entertained, observation should be invoked to be the judge as to which theory explains better the real world. However it seems that even if we take an optimistic view on the capability of empirical work to distinguish between competing theories, with issues related to capital structure applied work has proved to be rather inconclusive.

It may be a mistake to overemphasise failures, though. One can still believe that a lot of advances have been made in this field, as a result of both analytical and empirical exercises. It has been possible to sort out a certain number of stylised facts, as summarised by Meyer (1989), for instance. Theoretical developments have provided us with many insights that one feels are quite useful in policy analysis of finance and development, or in the recently very popular discussions on financial stability. All of these made it possible that when the transition started around 1990 economists could debate in a more informed, than would have been available even 10 years earlier manner how formerly planned economies should transform their corporate sector

Having said that one may perceive that after several years of experience with transition we have still to cope with tremendous problems, and our knowledge is much less than adequate. Practical implementation of policy advice was probably rather eclectic in each country, and we can see that most CEE economies have still not found the optimal, or even satisfactory way of corporate control, and the related financial system structure. The financing of small and medium sized enterprises has been an issue in Hungary, the failure of bank-led corporate control might have contributed to the recent crisis in the Czech Republic, and many economists feel that slow privatisation may lead to future difficulties in Poland or in Slovakia. Even where transformation is probably the most complete, in the former East Germany, it can be argued (Driffill-Miller (1998)) that there have been serious losses during the transition process, whose reverberations may have further negative effects later on.

Beyond sheer intellectual curiosity studying capital structure has relevance from at least two perspectives. First, efficiency and growth are presumably affected by financing decisions. Second, when investigating the monetary transmission mechanism it has been found that the structure of

the financial sector and the ways of enterprise financing have had a substantial impact on the transmission process. (Cash or liquidity constraints, the availability of collateral has been proved to have explanatory power for investment and for consumption, and the existence of credit rationing may imply a very different transmission mechanism from the one that would be derived from a market-clearing framework.)[2] We learn from the theoretical literature that it is not necessary that existing capital structures are first best optimal, rather we should assume that they are not. Also the variety of enterprise financing patterns in industrial countries may suggest that probably there does not exist a single equilibrium configuration to which all the world converge. Thus we may guess that history might be relevant, and initial states are not to be disregarded. Then there is room for improving the financial system, and when one has the opportunity to design institutions, as at the beginning of transition, one has to be careful.

In the following Section a short literature survey is presented, then in Section 3 we describe lending history in Hungary, as bank lending is the main determinant of debt in this country. Section 4 discusses the main hypothesis we want to test in this paper. Chapter 5 first reports some preliminary data analysis, which is followed by the econometric investigation. The concluding Section summarises and formulates questions for further work.

2. A short survey of the previous literature

The literature contains arguments why outside equity financing should be very important, relative to debt finance, in transition economies, and also why the case must be diametrically opposite. The proposal by McKinnon (1993) provided a theoretical rationale for such an outside equity driven financing scenario. He argued that bank intermediation should be reduced during the first phase of the transition, to avoid serious misallocation of funds, due to the above-mentioned moral hazard and adverse selection problems. Kletzer and Roldos (1996) however argued that the „wrong" initial availability of equity capital might have made outside equity financing as, or even more, inefficient than bank financing.

Empirical investigations of leverage in transition countries have been reported in Cornelli-Portes-Schaffer (1996) for Hungary and Poland, Csermely (1996) for Hungary, Hussain-Nivorozhkin (1997) for Poland, and Revoltella (1998) for the Czech Republic. Revoltella (1998) examines indebtedness for quoted Czech enterprises in the framework of a latent variable model. Her most important findings include a positive relationship with respect to size and a negative one with respect to profitability. She interprets these findings as suggesting that more profitable enterprises try to get rid of expensive debt, and as indicating that banks discriminate against smaller firms. Hussain-Nivorozhkin (1997) found low level of leverage for stock exchange listed firms compared to similar Indonesian companies. Leverage increases if a firm is large, foreign owned, new, and has concentrated ownership. Cornelli-Portes-Schaffer (1996) asserts that the pecking order theory must be valid for transition countries, as the reasons explaining the theory are present even more forcefully in these countries than elsewhere. Cornelli-Portes-Schaffer (1996) also advances the

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[2] It is interesting to note that many economists identify efficiency of financial intermediation with the effectiveness of the transmission mechanism. This identification is not at all warranted.

hypothesis that low bankruptcy costs and tax considerations would suggest higher optimal leverage in CEEs than in the West, whereas higher profitability would also increase leverage. Now this argument may neglect the issue that low bankruptcy costs would exacerbate moral hazard, and thus should make banks very cautious with lending. The example of bankruptcy costs illustrates a general point: modelling leverage cannot be a simple demand-supply analysis, rather it should belong to the theory of contracts, or in general to game theory. But as we know game theoretical models can suffer from the weakness that small changes in the extensive form can lead to drastically different conclusions. It is rather difficult to identify the best extensive form for an economic situation. The empirical findings of Cornelli-Portes-Schaffer (1996) can be summarised as follows. As opposed to (their) theoretical expectations neither profitability, nor tangibility was positively related to leverage, rather on the contrary. When analysing new debt leverage rather than total, Cornelli-Portes-Schaffer (1996) found that the negative relationship between leverage and profitability still prevails, though the impact of tangibility becomes irrelevant. If we take seriously the profitability result it seems to imply that there exists a significant amount of adverse selection on the credit market, and at the prevailing interest rates mostly less profitable firms turn to banks, while others attempt to finance investments from other sources. With the strange effect of tangibility we must notice that the reason why tangibility is thought to be positively related to leverage is that the more tangible assets a firm possesses the higher collateral requirements it can bear. However to apply this reasoning to transition economies ignores two potentially important features of these economies. The first is the possibility that secondary markets for tangible assets might not be deep enough to provide a sound assessment of the value of collateral. The second is that bankruptcy and liquidation proceedings might be too inefficient and slow.

Csermely (1996) examined a sample of enterprises over the period 1991-94. One important finding is that initially the most powerful factor in determining capital structure was the change in ownership rights. In 1992 outside equity represented the largest part of new funds, the relative share of debt in new funding decreased. This observation can be compared to the Cornelli-Portes-Schaffer (1996) hypothesis that initial (pretransition) conditions can explain the fact that leverage in CEEs is lower than in other developing or industrial countries. The hypothesis of Csermely (1996) suggests that a move toward equity finance occurred at the beginning of transition, possibly because of the credit crunch (see next Section). Studying later years it appears that internal financing became the main determinant of investment financing by 1994, caused partly by improvements in profitability but also because profits were retained to a higher extent than before. (Asset stripping might have been more prevalent before privatisation gained momentum.) The paper formulates a hypothesis that cannot be confirmed on the given data set: the increase in bank credits was mostly due to foreign and foreign exchange borrowing. Those enterprises that exported their products to a larger than average extent and also those firms where foreign ownership was more pronounced had, probably, a better access to these channels of credit. The study also comments on the fact that the average cost of borrowing was definitely higher over the whole period than the return on capital the firms were able to achieve. Though the exact numerical relationship need not be taken literally[3], this might explain the Cornelli-Portes-Schaffer (1996) finding on the negative effect of profitability on leverage. It might mean that more profitable firms

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[3] There might have been accounting problems under relatively high inflation that might have caused that nominally accounted asset values were below their market value, for which we do not have reliable estimates

were able to substitute own capital for too expensive loans. Whereas many firms that may have lost profits by keeping to the current level of leverage might have thought it wise to suffer short-term losses in order to survive and retain market share.[4] (Also pre-privatisation managers' interests can be relevant here. From their point of view sustaining operations may have been good for showing off to future buyers. Also closing up unprofitable activities may have reduced their scope of asset stripping.) A significant observation is that those enterprises that reduced their exposure to banks in 1992 were able to invest, whereas those whose exposure decreased in 1993/94 did not invest much in those years. This might suggest that in 1992 reduction in leverage could be explained by firms' search for cheaper sources of financing, whereas in 93-94 banks reduced the leverage of those firms whose debt levels seemed to be excessive. This latter guess is supported by the finding that in general borrowing decreased by firms with weaker financial indicators. It also seemed to be the case that an increase in outside equity signalled to banks the creditworthiness of enterprises, and lending to firms that had previously raised outside equity expanded.

3. Bank lending in Hungary in the 1990s

For many developing countries a sharp credit boom accompanied the period of financial liberalisation. A remarkable stylised fact of bank lending in Hungary, and also in some other transition countries, is that the first half of the 1990s brought about a large scale downgrading in banking sector operations. (See Table 1.) The increase in the balance sheet of the domestic banking sector fell short of both nominal GDP growth and inflation. Corporate lending declined even more severely, it shrank in real terms and in comparison to the total assets of the banking sector. After five years of contraction, the Hungarian banking sector set out on a path of normal development only in 1996.[5]

Total credit flows to enterprises exhibited a slightly different picture. (See Chart 1.) Total - domestic and foreign- net credit flows into the enterprise sector started to increase in 1993, and became more robust following the resumption of growth in 1996. These developments indicate that in the first years of financial liberalisation the domestic banking sector was crowded out from enterprise finance, and relatively more funds were raised directly from foreign partner companies and from non-resident banks. Since 1996 a buoyant domestic credit expansion has begun. In 1996 it went hand in hand with strong direct foreign borrowing, while in 1997 the flow of direct foreign credit dried up, and domestic banks reconquered their positions in intermediation.

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[4] See however our different parameter estimates in this paper.

[5] Several authors have noticed that transition countries did not only exhibit a surprisingly low level of leverage at the outset, this even decreased at the first stage of transition, as if it had been a manifestation that McKinnon's proposal (see the previous section) was silently adopted.

Table 1

	1989	1990	1991	1992	1993	1994	1995	1996	1997
Total assets of the banking sector/GDP	76,4%	79,9%	86,8%	79,3%	74,1%	70,3%	66,4%	66,9%	67,6%
Corporate loans/GDP*	26,1%	28,2%	29,9%	23,3%	20,7%	20,2%	18,7%	18,7%	20,6%
Corporate loans/total assets of the banking sector*	34,1%	35,4%	34,4%	29,5%	28,0%	28,7%	28,3%	28,3%	30,5%
Corporate loan volume index*	100	104,5	97,3	73,6	64,9	65,2	61,4	63,5	72,9
Total (foreign + domestic) credit to the corporate sector/GDP				28,6%	27,6%	29,8%	29,6%	28,4%	29,5%

*disbursed by the domestic banking sector

It is a contentious issue whether some transition countries (including Hungary) suffered from a credit crunch in the early nineties. If we define a credit crunch as a sharp decline in real credits then this might occur for either demand or supply side reasons. There might be a large shift in the willingness of banks to grant loans, which itself can be attributed to several underlying causes influencing bank behaviour. On the other hand credit crunches can happen because of large changes in credit demand, whose underlying causes may not be independent of those determining bank behaviour. In the Hungarian case one can think of, at least, two different explanations for the credit crunch that is apparent in Table 1 below.. 1. Banks, because of changes in incentives (caused by the prospect of privatisation or by changes in the legal framework) became very cautious lenders, and not wanting to finance loss-making enterprises shifted their supply from risky enterprise credit to safe government security investments. 2. Enterprise privatisation might have led to more prudent borrowing on the part of firms, as private companies could not anymore hope that they would be bailed out (a hardening of the budget constraint).

Chart 1

Real growth of enterprise credit disbursed by residents and non-residents
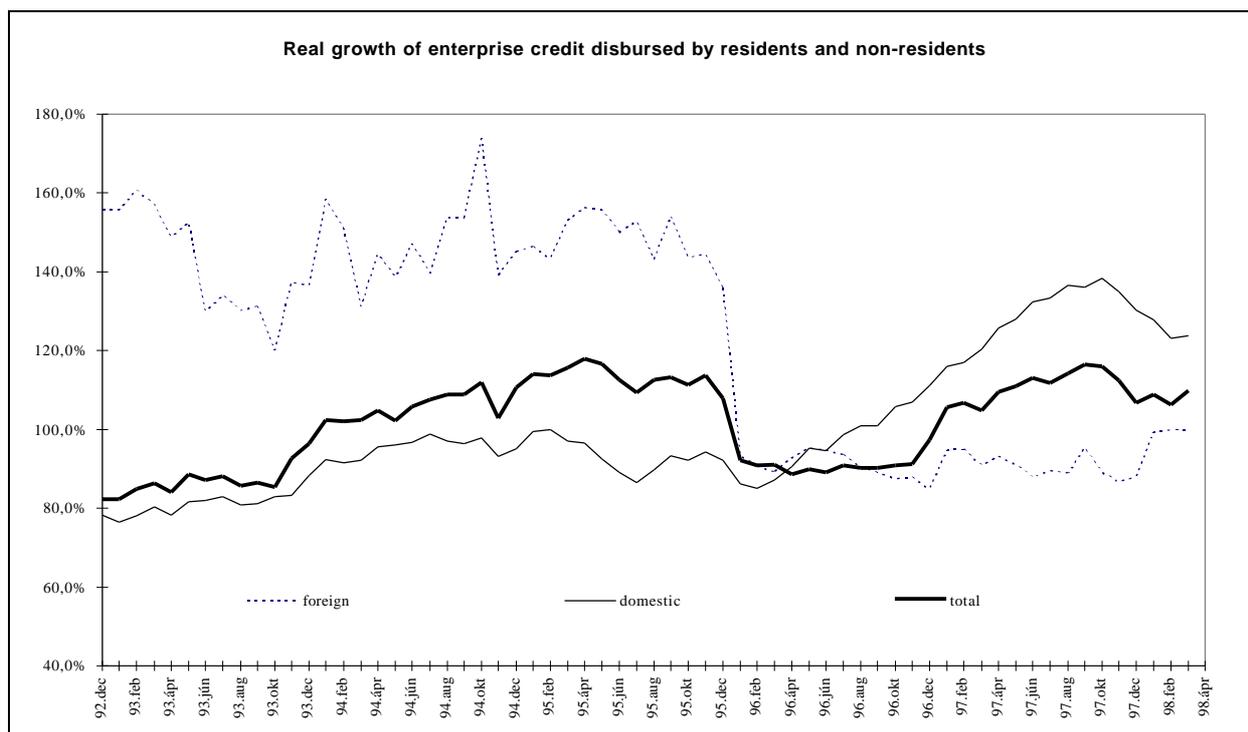
Source: National Bank of Hungary

At a first glance a demand side explanation looks plausible as the cyclical pattern of borrowing followed by and large the fluctuation in output. In the years of the output decline (1992-93) net credit flows to enterprises were negative. Wait and see attitude towards new investments might have reduced the demand for credit by firms. Also, the wave of bankruptcies and liquidation procedures of those times resulted in tighter financial discipline, which might have implied more cautious corporate borrowing strategies. Domestic demand and economic growth began to recover in 1996, which also gave boost to corporate demand for credit.

On the supply side one has to consider, inter alia, how legislation shaped the structure of financial intermediation. Liberalisation of financial intermediation took almost a decade in Hungary, and the last elements of legislation required for the introduction of prudent banking practices were adopted only in 1996. As a first step in this process the two tier banking system was established in 1987. At this time the regulatory environment was liberalised by giving freedom in lending decisions and allowing commercial banks to provide a wide range of consumer services. A new legal framework for the operation of credit institutions was adopted in 1993. Among others, the rules applied to general reserve and provisioning were amended according to OECD standards. Another important factor in the development of financial intermediation was the adoption of the Act on Foreign Exchange in 1995 that contains the provision governing convertibility at a level required by the OECD and the IMF. The law permits without limitation all of the common current account transactions, and widens the scope of capital account transactions for which no licence is required. Finally, a package of financial regulation was enacted in 1996. This final step constituted

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substantial progress towards facilitating the secure operation of the banks, their more stringent control and supervision, the integration of money and capital markets, and convergence to EU regulations. Thus liberalisation evolved in a circumspect manner, and its – presumably – positive impact on the extent of intermediation took place progressively, not suddenly at the beginning of transition.

At the beginning of the 1990s the domestic banking system consisted of a few state owned, undercapitalised commercial and investment banks with a significant nonperforming debt portfolio. Deep recession accompanying the start of transition escalated the bad debt problem in 1992-93. A rather strict bankruptcy law passed in 1992 made almost impossible the rolling over of bad loans, that revealed capital deficiencies accumulated in previous years. Moreover, to conform to OECD standards capital adequacy ratios were increased up to 8% in 1993. These steps absorbed almost the total equity of the domestic banking sector. This led to a series of consolidation schemes, both bank and loan, that resulted in cleaning up of bank portfolios, through a swap of bad enterprise debts with government securities.

Consolidation schemes provided funds for the traditional banks to the extent that they comply with the capital requirement regulation, but prevented them from expanding their lending activities. These consolidated banks could clean their portfolio only gradually by selling bad loans to workout subsidiaries. Consequently, their asset portfolios had to be restructured towards risk-free investments. It also improved their profitability, because in its infant state only money market participants had access to government securities offering high interest premia. Relatively high rates offered on foreign exchange deposits at the central bank (to improve the international reserve position) also prevented banks from disbursing foreign exchange credits to enterprises.

Parallel to the progress of financial liberalisation and of prudential regulation, the ownership structure of the banking sector also underwent significant changes. Here the development was first rather slow, but later in 1995-96 more radical changes occurred. Non-resident ownership began to gain ground gradually since the late eighties, but the process has accelerated since 1995. The major driving force of change was privatisation; that is, selling equity of the formerly state owned banks to strategic investors. New bank foundations also took place.

After 1993 there has seemed to exist a rather fierce competition for the best borrowers, i.e. for those enterprises that remained on the scene as creditworthy. Traditional domestic banks were not very successful in this competition and foreign-owned banks as well as direct foreign borrowing crowded out credit in this sector by domestic state owned banks to a large extent. The reasons why traditional domestic banks lost market shares were manifold, but their higher financing costs might have been decisive. This was partly due to high-risk premia on Forint investments, high reserve requirements, and because these banks might have not been as good borrowers as to have AAA rating on international markets. The latter can be explained by their weak and not fully transparent balance sheets owing to the lack of proper regulation, poorer personal and technical background, the inability to acquire adequate fee incomes through improved services, and ultimately by the less than optimal incentives provided by state ownership.

Another drawback of domestic banks arose from the fact that as a consequence of volatile inflation expectations they had very limited long term sources. They could offer only loans maturing within a year, in order to minimise liquidity risk. It is also probable that the expansion of foreign-owned banks' activities and FDI went hand in hand. Foreign banks lent to Hungarian subsidiaries whose mother companies had been their customers for a long time. Thus, the larger domestic banks were left with enterprises of lower quality, and contracted lending. Another possible strategy was to provide credits for blue chips at very low rates, actually below T-Bill rates.

Domestic intermediation has recovered since 1996, and credit has been channelled through the domestic banking sector again. The main reason behind this was the monitoring advantages of local premises. Former obstacles of domestic lending have gradually been alleviated. At the end of 1996 85% of the domestic banking sector was run under foreign control. Decline in the risk premium of Forint investments made credits denominated in Forint more attractive. Development of derivative markets allowed banks to convert foreign currency funds into Forint assets while complying with the regulation on open (foreign exchange) position. In this way cheaper foreign funds not subject to reserve requirements can be converted into domestic assets. Portfolio reallocation due to the erosion of the interest premium on government securities also contributed to the process, and the growth of corporate lending outpaced that of the total balance sheet of the banking sector. As the market of best corporate clients has become saturated a new clientele could be found among medium sized companies.

4. Theoretical underpinnings

Like several other authors (see e.g. Cornelli-Portes-Schaffer (1996)), we start with the observation that there exist very serious asymmetric information problems at the beginning of transition. A short list of these includes the lack of relevant credit history, little experience of potential lenders, shortcomings of the legal framework and bad law enforcement. We can add to this list also opaque property rights, and the very issue of „unsettled" preferences. Usually theories of capital structure involve agents such as owners who have monetary incentives, and managers who have private agendas. On the financiers' side it is normally assumed that pecuniary incentives are predominant. However in a system where there are many state-controlled banks and enterprises, the situation is prone to be more complicated. For instance, there must be problems with the incentives of bank managers. Also managers' private incentives are not clear when their actions might bear on the prospective privatisation of the firm they work for. Another important point is that firms as such had not been organised on market economy principles before 1990. Thus restructuring must have involved a substantial recombination of assets, and there might have been some doubts whether firms as they existed at the initial phases of transition can be taken as the appropriate unit of investigation, i.e. „individuals" having some historical continuity.

Indeed restructuring enterprises went on, probably, at historically unprecedented steps. Despite expectations of little adjustment in non-privatised firms it was a general impression that even state-owned firms shed labour to a significant extent. Grosfeld-Roland (1995) makes a distinction between defensive and strategic restructuring, and claims that the larger part of restructuring was

defensive. Whatever was the original motive it is plausible firms wanting to get sufficient external financing had to resort to novel ways to acquire it. As prudential regulation and privatisation evolved in the banking sector this must have entailed finding ways to signal enterprise creditworthiness. For Poland it was suggested by Colombo (1997), that signalling through excessive layoffs might have been a feasible method. As every signalling argument this one has also to rely on relative costs of signalling, i.e. better firms' managers can tolerate the costs of layoffs more easily than worse firms' managers, thus they can use layoffs as a signalling device.

However Hungary differed significantly from Poland in the sense that trade unions and worker participation in business decision making was probably less significant than in Poland. Here the rise in unemployment started in earnest when the outstanding amount of real credit collapsed. Before that period, while output fell employment and the amount of loans did not substantially decrease. In fact these observations would suggest a different explanation for restructuring in the Hungarian case: Workers were laid off because of the credit crunch initiated by banks that had to adjust as a result of new banking regulation, (see previous section), as recession made working capital financing very difficult. (Another way to solve the problem was accumulating arrears, both interenterprise and tax.) Indeed after the loan consolidation in Hungary banks behaved very, one can even say too, prudently in their lending decisions.

On the other hand Hungary had a privatisation strategy that preferred selling for cash, and especially for hard currency. These features could be explained on efficiency grounds, and also by the concern for foreign exchange reserves, but these latter considerations are not so important for us for the sake of the present analysis. What is important is the fact, that seeking foreign investors and promoting sale to foreigners was not unheard of, but rather it was an encouraged activity in this country. This raises the possibility that managers eager to keep their position, and to assure the survival of their firms, could assign an important role for drawing in foreign capital in order to signal to banks their firm's intrinsic value, getting thereby adequate debt financing, which has contributed to the maintenance of the value of their firm.

Thus our main hypothesis suggests that foreign investment in a firm could serve as a useful signal of creditworthiness. Foreign companies working in the same industry must have had the necessary knowledge to judge whether a given firm had the requisite human and physical capital to be viable in a competitive market environment. Any positive net worth firm is in principle worthy of consideration of a buyer if the acquisition price can be set at a level low enough to achieve the required return, but there might have been good reasons to believe that it was infeasible to achieve very low prices. Thus the fact that some foreign firm is willing to invest money into an enterprise must have been taken as prima facie evidence for its viability. The question is whether those managers for whom foreign participation was only second best should have chosen this way of signalling, in order to differentiate themselves from unviable enterprises. So it was not a question of who could signal, but of who would want to. However, we can assume that those who had the appropriate incentives were able, on average, to use this signalling channel effectively.

5. Statistical analysis

5.1 Data description

The data set we used to reveal financial patterns consists of the year-end financial statements of individual Hungarian enterprises taken from the KOPINT-DATORG database for 1993-96. This database incorporates the balance sheets and income statements of all non-financial enterprises that paid corporate taxes at the end of the year. Only the largest companies that met two of the following three conditions; net sales exceed 300 million HUF, total assets exceed 150 million HUF, and number of employees exceeds 100, are obliged to report their liabilities with the banks. It gives 3-4000 enterprises in every year.

This population practically includes all the large and medium sized companies that existed in Hungary in these years. The number of the firms meeting the criteria above increased by 50 % over the period. Parallel to the formation of new entities the ownership structure of the existing companies also changed. State owned companies halved in the population, partly due to privatization, and partly due to the liquidation of companies.

Table 2

Ownership structure of the companies

| Number of firms owned by	1993	1994	1995	1996
Persons	1030	985	1368	1426
Domestic companies	467	626	933	999
State	786	567	459	325
Foreign shareholders	497	554	871	997
Others	417	339	412	1214
Total	3197	3071	4043	4961

Categories were defined according to the owner of the highest stake in equity, if this stake was higher than 20%.

On average, companies had rather poor growth potential and their earning power was also weak in the period under investigation. The last year in the sample brought about a slight upturn in both dimensions. Considering total assets in real terms (using the GDP deflator), in 1994-5 only a tenth of the companies could expand its balance sheet. In 1996 growth perspectives improved, a fifth of the firms could enlarge its asset base[6]. Measuring real revenue growth, in every year 60% of the companies suffered a drop in real revenues, while a fifth of the firms exhibited remarkably high growth potential.

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[6] Hungarian book keeping rules do not allow for assigning market values to fixed assets in the balance sheet, implying significant distortions in an inflationary environment. The value of current assets expands in tandem with inflation (though the cost of replacement may also be underestimated due to LIFO type accounting standards), but the value of fixed assets is generally understated in times of rising prices. This implies a downward bias in the growth indices based on growth in total assets

Chart 2

Growth of total revenues in real terms in deciles of the sample
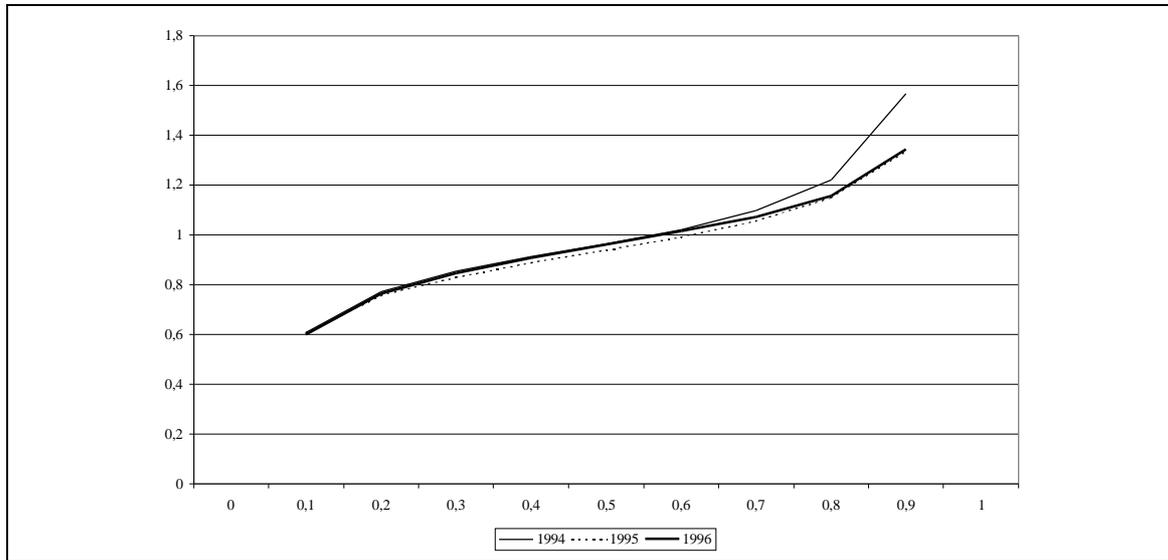
Profitability of the companies significantly improved in the period under investigation. Return on investment (ROI) increased from 5% to 10% at the median company (The ROI was calculated as the ratio of cash flow to total liabilities). Despite this improvement, the indices still reveal substantially lower yields on real investments than on financial assets. In 1993-5 only a tenth of the companies could reach positive real yields. In 1996 the number of companies displaying positive real return on total investment doubled.

One may suspect that improvement in the enterprise perspectives may be linked to the introduction of many additional firms into the database. In fact, newcomer enterprises did have better growth potential in every year under investigation, while one can not find significant difference between the earning power of old and new companies.

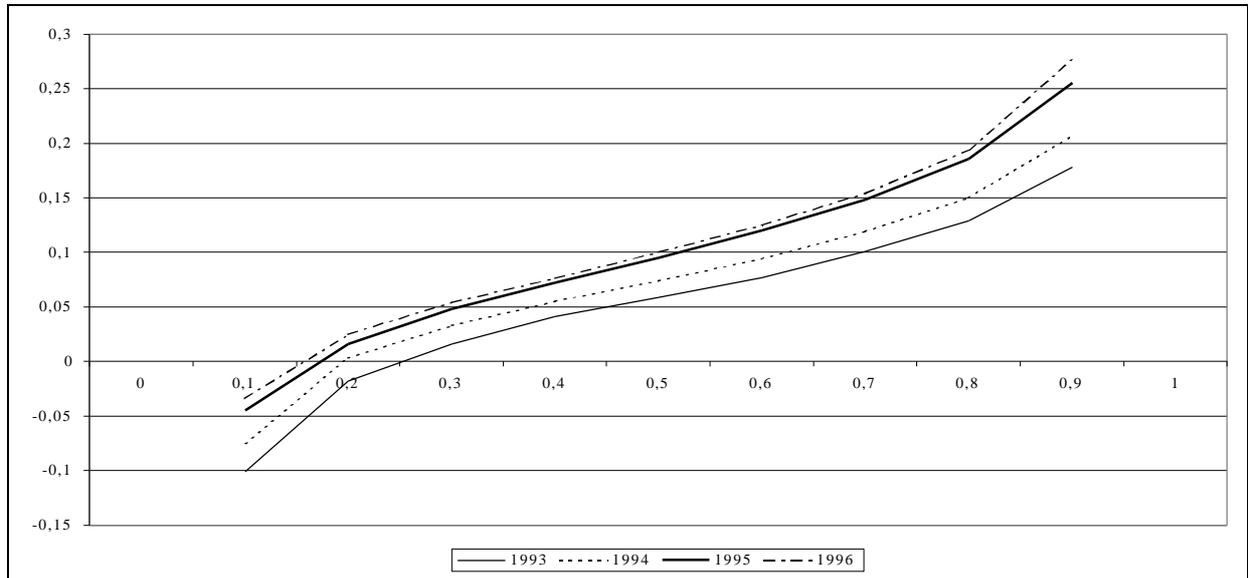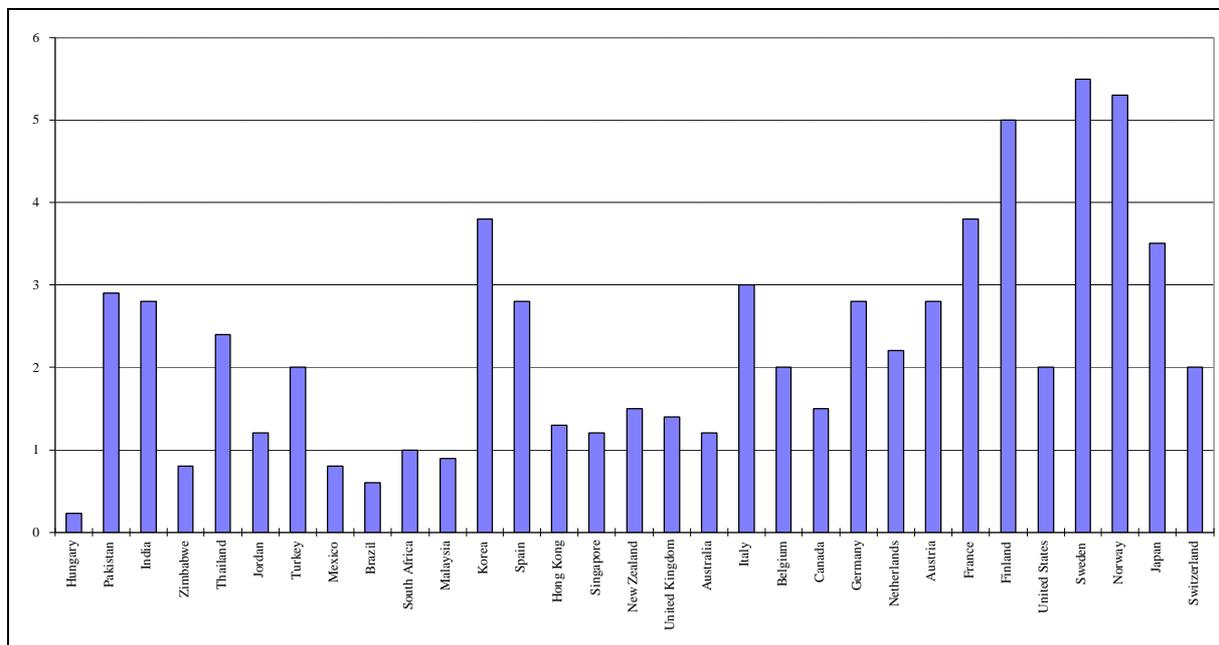**Chart 3**

ROI in deciles of the sample

Chart 4

Debt to equity ratio in selected countries

Demirgüc-Kunt and Levine (1996): Stock Markets, Corporate Finance, and Economic Growth, The World Bank Economic Review, 10/2, pp. 234, Hungary: own estimations. The countries except Hungary are sorted by per capita GDP in 1991.

At the beginning of the period the average debt to equity ratio was extremely low according to international comparison, even if countries with similar GDP per capita ratios are considered. Financial structure has changed slowly, the debt to equity ratio increased from the level of 33% in 1993 to 42% in 1996. The following table shows the contribution of balance sheet items to the growth of total liabilities for those companies that existed in two subsequent years, exiting and entering companies are excluded.

Table 3

Contribution of balance sheet items to the growth of total liabilities (%)

	1994	1995	1996
Bank credit	20,0	32,2	40,5
-o/w short	8,8	19,7	20,9
-o/w long	11,2	12,6	19,6
Equity	30,9	21,4	25,1
Retained earnings	-15,5	-3,7	4,7
Trade credit	33,4	31,2	21,0
Other long term liabilities	16,8	12,0	1,2
Growth of total liabilities	100,0	100,0	100,0
Growth rate of total liabilities	5,0	9,4	12,9

Despite the improvement in overall profitability internal sources had no marked role in the expansion of the companies at the aggregate level. Among external sources issuing new equity was always an attractive way of financing. In 1994 and 1995 alternative sources like trade credit and raising other long-term liabilities were also exploited.[7] Other long-term finance normally consisted of credits from shareholders, while bond finance had a minor role in the whole period. Shareholders' credit was an alternative to raising equity. Primarily it was used for tax avoidance since interest payments were not subject to corporate income tax, and it also served as a device to limit owners' exposure to bankruptcy[8].

Compared to other sources the importance of bank finance increased to some extent in these years. The ratio of bank debt to total liabilities fell significantly in 1994 and than it returned to the 1993 level in 1996. Loans were unevenly distributed among firms, more than a third of them had no bank debt at all, and only a tenth of the firms had bank debt to total liabilities ratio higher than 30%. In 1996 bank debt stood at 3% of the total liabilities in the median company.

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[7] At several companies increasing arrears in accounts payable and deferred taxes covered a large part of operating losses.

[8] As other debt items, shareholders' credit is senior to the common equity. Insider information can make it effectively „senior" to ordinary debt.

Chart 5

Bank debt to total liabilities in deciles of the sample
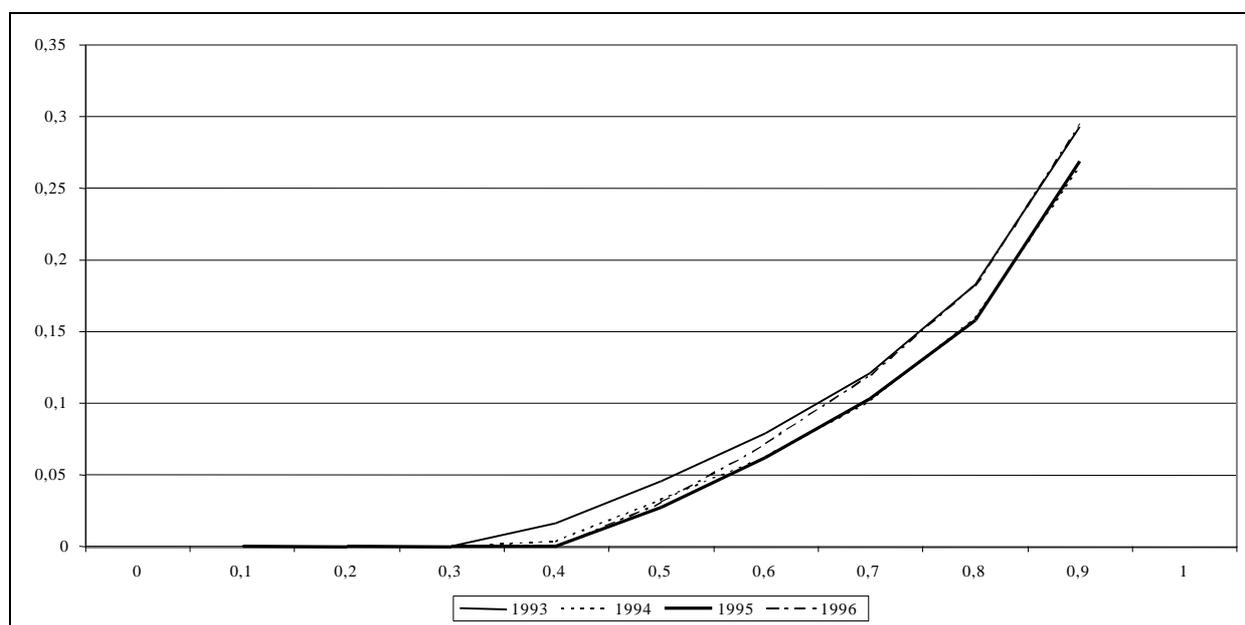
These results seemingly contradict to the pecking order theory. Dominance of issuing new equity can be explained by the fact that in case of the largest and most important companies privatization was inspired by the government to involve strategic investors and raise government revenues from selling majority stakes of these companies. On the other hand, in most of the cases the management of the company had a decisive impact on transformation and forming modernisation strategy of the companies. In this latter case divergence from pecking order can be associated to their limited access to other types of finance, especially to bank finance.

In Section 3 we argued that low capital adequacy ratios of the banks severely limited the banking sector ability to finance risk-bearing projects. Inadequate monitoring skills of the banks could also make them refrain from lending to enterprises. Enterprises ability to repay debt could also impose a constraint on access to bank finance. It may well be the case that the short-term liquidity position of the companies was worse than their long-term solvency, consequently companies could attract investors only with longer horizon. The following table supports this type of reasoning. We compared interest payments to cash flow of the companies. The higher the interest coverage ratio the higher the probability that liquidity problems emerge due to unexpected changes in revenues or in nominal interest rates[9]. At the beginning of the period 41% of the total credit outstanding was held by companies with lower total cash flow than interest burden on their debt. In 1994 this ratio dropped to 28% mainly because of the withdrawal of credit from these practically insolvent firms. In 1996 both stronger earning power of the firms and the drop in nominal interest rates

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[9] In this years credits with short maturity were dominant in bank lending. Term finance was provided at floating rates or in foreign currency denomination. In this latter case unexpected changes in the exchange rate could also increase the debt burden.

contributed to the improvement in the quality of the credit portfolio of the banks, and as expected, it was accompanied by expanding lending activity..

Table 4

Distribution of total credit outstanding according to interest coverage ratio (%)

	1993	1994	1995	1996
0-0.25	14,6	22,5	25,2	17,0
0.25-0.50	21,0	25,7	23,4	48,4
0.5-0.75	14,0	12,9	17,5	5,0
0.75-1	9,4	10,9	7,0	6,2
>1	19,2	13,3	11,2	9,5
Negative cash flow	21,7	14,6	15,5	15,7

Ownership had a significant impact on balance sheet structure. Bank leverage was highest among foreign owned companies, suggesting support for our central hypothesis, and lowest among the companies with highly dispersed ownership. In the case of state owned companies the role of bank finance diminished over time, from 12% to 8%. From 1993 to 1996 the share of total credit outstanding assigned to foreign owned companies increased from 32% to 53%. Considering total borrowing the same tendency can be detected; foreign owned companies had better access to debt finance in general.

Table 5

Bank credits to total liabilities ratio

	1993	1994	1995	1996
Personal	0,10	0,09	0,09	0,10
Domestic companies	0,11	0,09	0,09	0,10
State	0,12	0,08	0,06	0,08
Foreign shareholders	0,12	0,13	0,13	0,13
Others	0,07	0,06	0,05	0,08
Total	0,10	0,09	0,09	0,10
F-stat	**7,52**	**11,97**	**22,78**	**8,87**

5.2 Regression results

In the following we report the results of our investigation on the signalling effect of privatization to foreigners on the access to bank finance. Though simple data description seems to be in favour of our hypothesis regression analysis is required to sort out possible common factors. From the data set we excluded those companies that belonged to branches where acquisition of equity by foreigners was prohibited by law in the period under investigation. These branches were agriculture, mining, electricity and water supply. Further restrictions were also applied for branches where state ownership remained dominant for other reasons, so we also excluded public

administration and defence, education, health and social work, and other community, social and personal services from the analysis.

After the above mentioned exclusions our data base consisted of financial statements of 2334 enterprises in 1993 and 3281 companies in 1996. In this period the average foreign equity share increased from 16% to 25%, and the number of enterprises with foreign owners possessing more than 20 % stake increased from 20% to 30%. In this subgroup of companies with „significant" foreign ownership the average size of the foreign stake increased from 67% in 1993 to 79% in 1996 showing that foreigners normally acquired a majority stake, and further ownership concentration took place over time.

Table 6

Sample characteristics				
	1993	**1994**	**1995**	**1996**
No. of companies	2334	2483	3144	3281
Companies with foreign ownership	497	594	892	982
Average foreign equity share	0,15	0,18	0,21	0,25

According to our basic hypothesis, companies sold to foreigners faced less severe constraints on acquiring bank credit, thus these firms have grown „optimally", and their leverage approached the optimum quite quickly. Thus to formulate the hypothesis empirically we had to use different equations for each year, in order that the approach to eventual equilibrium be captured.

We experimented with two definitions of leverage: total liabilities and bank credit divided by total (book) asset value. Eventually we only used leverage defined by bank credit, which by far the most important source of debt financing for Hungarian enterprises. Developments in total borrowed reserved are difficult to interpret, because involuntary trade credits and arrears to Tax Authorities were widespread. Another important source has been owner's loans, which should rather belong to equity.[10]

Table 9

Bank leverage			
	1994	**1995**	**1996**
MEAN	0.1263	0.1305	0.1424
St. DEVIATION	0.1928	0.2025	0.2131
SKEWNESS	1.8770	1.8243	1.6712

Table 8 contains descriptive statistics concerning bank leverage in our sample. Leverage decreased between 1993 and 1994 then started to increase in 1995 again but its mean was still lower in 1996 than in 1993. This is in accordance with what we said about the history of lending, thus our

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[10] Outliers were dropped from the sample by a 5-sigma rule.

sample may be roughly representative. Higher order moments were relatively stable, with a positive skewness, that indicate that many extremely levered enterprises might have gone bankrupt. (see „survival" functions bellow.) Also correlations between successive years show a steady increase, indicating more stability over time.

To test our central hypothesis we ran regressions for bank leverage in 1994, 1995 and 1996 as dependent variables. As zero leverage observations occurred in all of these years at least in 25 % of the total, we applied a censored regression methodology. Our original model was the following:

$y = b$'X $+ u$, if y > 0
$y = 0$ otherwise.

The problem with the OLS estimation of this model is that E(u) $\neq$ 0. Following Heckman (1976) we used a two-stage method to estimate the following model, which is equivalent to the first one for non-zero observations.

$$E(y \mid y > 0) = b\text{'}X + E(u|u > \text{-b"}X)$$
$$= b\text{'}X + \boldsymbol{d}(\phi/\Psi)$$

where ϕ and Ψ are the density function and the distribution function of the standard normal evaluated at b'X/δ. Thus the original model can be written as

$$y = \text{b'}X + \delta\ (\phi/\Psi) + v$$

where E(v)= 0. The problem in estimating model is that the variable ϕ/Ψ is not observable.

According to the Heckman two-step procedure we first define a dummy variable that equals 1 if the company has non-zero leverage, and equals zero otherwise. Then, by using the probit model, one can get the ML estimates of b/δ, and from this one can derive the estimated values of ϕ /Ψ (the inverse Mills ratio.)

To test for the signalling role of foreign ownership the dummy FSHK was put into the equations on the right hand side. Other explanatory variables included the more or less traditional list of variables used in other studies. The return on assets variable tries to capture firm performance; tangibility is a proxy for the liquidation value of the firm, sales variables are proxying size, reflecting the economies of scales of monitoring borrowers. In addition we devised another way to indirectly check whether financing patterns approximate those prevailing in industrial countries by defining high and low leverage dummies. In Harris-Raviv (1991) one can find a summary of studies concerning sectoral variability in leverage. Though the results are far from unambiguous we constructed high, and low leverage sectoral dummies. In order to avoid simultaneity problems we used lagged values, like Rajan-Zingales (1995) for the explanatory variables, where the concept was relevant.

The following variables were used in our analysis

BLEV   Bank credit divided by total liabilities
TANG   Tangible assets in percentage of total assets (book value)
SALE   Log of net sales
ROI   operating income minus corporate income tax plus depreciation divided
     by total assets
LIQ   liquidity ratio (current assets divided by current liabilities)
FSHK   Dummy for foreign ownership, it equals 1, if the foreign stake was
     greater than 20% of total equity, otherwise 0
DUMHIGH Dummy for branches considered to be highly leveraged according to
     international evidence (classification based on Harris and Raviv 1995)
DUMLOW Dummy for branches characterised by low leverage according to
     international evidence (classification based on Harris and Raviv 1995)

Low leverage industries: drugs, cosmetics, and instruments, metal mining, publishing,
        electronics, machinery, food.
High leverage industries: Glass, cement, airlines, electric and gas utilities, telephone,
        steel, trucking, retail, rubber, textile, and paper.

Table 10

**Means of exogenous variables in subsamples of companies with
and without bank credit**

Exogenous variables	1994			1995			1996		
	All	**D=1**	**D=0**	**All**	**D=1**	**D=0**	**All**	**D=1**	**D=0**
Nobs	1718	1057	661	1976	1155	821	2355	1359	996
BLEV(-1)	0,14	0,21	0,03	0,12	0,19	0,02	0,13	0,20	0,03
ROI(-1)	0,05	0,06	0,04	0,06	0,07	0,04	0,08	0,09	0,06
LIQ(-1)	0,47	0,29	0,75	0,77	0,33	1,39	1,72	0,31	3,65
TANG(-1)	0,51	0,52	0,50	0,51	0,53	0,49	0,47	0,49	0,46
SALE(-1)	13,22	13,50	12,77	13,16	13,55	12,62	13,38	13,78	12,84
FSHK	0,24	0,25	0,23	0,24	0,27	0,20	0,29	0,31	0,26
Low leverage dummy	0,26	0,29	0,23	0,26	0,29	0,21	0,26	0,29	0,21
High leverage dummy	0,28	0,27	0,30	0,26	0,26	0,26	0,24	0,26	0,23

As a sort of preliminary analysis of sample stability we first studied the characteristics of „surviving" firms. The tables below show average values for sales, leverage and cash flow for

subgroups that survived a given year, versus the group of firms that did not survive it. Since we had no information on whether bankruptcy or other reasons were influential in survival, the explanation of these numbers is not easy. Probit analysis of survival suggests that high leverage meant „trouble" mostly in 1993/94 whereas larger size and greater profitability might have improved the prospects of enterprises.

Table 7

Means of surviving companies

	1993/944	**1994/95**	**1995/96**
LEVERAGE	0.16	0.14	0.12
CASH FLOW	0.04	0.07	0.06
SALES	13.2	13.4	13.3

Table 8

Means of disappearing companies

	1993/94	**1994/95**	**1995/96**
LEVERAGE	0.36	0.15	0.15
CASH FLOW	-0.10	-0.02	-0.04
SALES	11.9	12.4	11.8

Table 8 presents our regression results for each year, together with a simple autoregressive alternative, as lagged leverage was always highly significant. According to both the Akaike and Schwartz criteria the „complex" model performed better than the simple one in each case.

Table 11

Dependent variable Variable	BLEV94 Coefficient(Std. Error)	BLEV95 Coefficient(Std. Error)	BLEV96 Coefficient(Std. Error)
C	0,07 (0,09)	-0,12 (0,07)	**-0,39** (0,10)
BLEV(-1)	**0,63** (0,05)	**0,84** (0,04)	**0,91** (0,05)
ROI(-1)	**0,08** (0,04)	**0,14** (0,04)	**0,18** (0,04)
LIQ(-1)	**-0,02** (0,01)	-0,01 (0,01)	-0,03 (0,01)
TANG(-1)	**-0,14** (0,03)	**-0,05** (0,02)	**-0,08** (0,03)
SALE(-1)	**0,01** (0,001)	**0,01** (0,002)	**0,03** (0,002)
FSHK	**0,02** (0,01)	**0,02** (0,01)	-0,01 (0,01)
Low leverage dummy	-0,01 (0,01)	0,001 (0,01)	**0,04** (0,01)
High leverage dummy	-0,01 (0,01)	-0,01 (0,01)	0,01 (0,01)
Inverse Mills ratios	0,04 (0,03)	**0,10** (0,03)	**0,21** (0,04)
Nobs	1057	1153	1359
R-squared	0,51	0,58	0,52
Adjusted R-squared	0,50	0,58	0,52
Mean dependent var	0,21	0,21	0,24
S.D. dependent var	0,20	0,20	0,21
S.E. of regression	0,14	0,13	0,15
Akaike info criterion	-3,91	-4,11	-3,79
Schwarz criterion	-3,86	-4,07	-3,75
F-statistic	120,32	176,86	161,66
AR(1)	Coefficient (Std. Error)	Coefficient(Std. Error)	Coefficient(Std. Error)
C	0,10 (0,03)	0,06 (0,02)	0,07 (0,03)
BLEV(-1)	0,58 (0,05)	0,74 (0,05)	0,74 (0,06)
Inverse Mills ratio	-0,03 (0,03)	0,01 (0,03)	0,04 (0,04)
R-squared	0,47	0,55	0,46
Adjusted R-squared	0,47	0,55	0,46
Akaike info criterion	-3,85	-4,04	-3,68
Schwarz criterion	-3,84	-4,03	-3,67

All of the estimates suggest that inertia for leverage has increased over time. Lagged values for leverage had the lowest parameter estimates in the 1994 equation. Foreign ownership might be seen as a predictor of higher leverage in 1994 and 1995, but not in 1996. This can be interpreted as giving support to the hypothesis that foreign ownership helped creditors recognising firms' good quality in the rather turbulent years of 1994-95, but it seems that its signalling role diminished, as one might expect, over time.

Comparing our findings to the former literature one may be surprised that the cash flow variable is significant and positive in all of the equations. This is the opposite of the usual finding, namely by holding investment constant more profitable firms have to borrow less. (See Rajan-Zingales (1995) for the G-7 countries.) However profitability can be a good proxy for growth opportunities in a transition economy, and thus can have an opposite sign. It may be the case that more profitable firms invest more, helped by large cash flow, and also want to invest even more using outside sources as well. This finding for Hungary is broadly consistent with the estimates for other transition economies, see Section 2.

We can confirm the previous finding that larger firms are more leveraged, that can be explained by economies of scale effects. (This relationship appears both for transition and G-7 countries.) Our estimates also support the Cornelli-Portes-Schaffer (1995) result in that tangibility has the unexpected sign. (See our comments in the Introduction on the explanation.) The liquidity ratio proved to be significant only in the 1994 regression, but it had a sign that is unexpected.

A possibly curious feature of our estimates is that the low leverage and the high leverage industry dummies are insignificant or have the opposite sign than expected. While one can expect that the developments of the capital structure will follow international industry characteristics in the longer term, our results suggest that during the period under investigation other distortions determined the restructuring of the enterprise balance sheets.

6. Conclusion and further work

In this paper an account of enterprise leverage in Hungary until 1996 was taken. We documented some identifiable changes over time, and found evidence that financing patterns may have settled down recently. Using a methodology that takes care of zero-leverage observations, a significant problem in the sample we studied, we reproduced findings that seem to describe the characteristics of enterprise capital structure in transition economies, and some of, which are special with respect to industrial country experience. In addition we focused on the role of foreign equity ownership as a signalling device to indicate firms' creditworthiness. Our estimates are consistent with the hypothesis that this was an important channel to transmit information from companies to banks at the time when the informational problems were severe, but lost significance when these were presumably alleviated.

An obvious extension of our work would consist of the study of 1997 data. As it has been found that changes in leverage became smaller, 1997 figures might be closer to some long run equilibrium. It is possible to improve the estimation methodology either by using maximum likelihood, or some robust techniques, as non-normality can be a problem. Another way to extend this work would be to estimate multiple equation systems, with leverage, investment and ownership as endogenous variables. Setting up a dynamic panel model would be a difficult, but potentially fruitful exercise.

Another interesting route of investigation would be to elucidate the sectoral paradox, that is the fact that high and low leverage dummies have no explanatory power in the regressions. In the eighties a certain number of larger companies had high levels of leverage, because of the nature of late-socialist policies in Hungary. These included a substantial centralisation of enterprise profits, and the redistribution of these profits for investment purposes in the form of bank credits, rather than as „free" government subsidies. Thus leverage was higher in many segments of the economy than would have been in a private-ownership-based economy. If this is correct the credit crunch might have been an equilibrium phenomenon, in the sense, that it caused a substantial reduction in leverage in line with the „optimal" financial structure of privately owned firms financed by capital markets or privately owned-banks.[11] The insignificance of sectoral dummies may indicate that the initial leverage might have mattered. Conducting a sectoral analysis might enhance our understanding substantially in this respect.

On the theoretical level our central hypothesis was formulated in a vague manner. It might yield additional insight and testable restrictions if a formal model along the same lines were set up. The skeleton of the model would look like this: let us suppose that initially managers of state-owned firms had certain discretion over privatisation of the company. We can assume that they could either initiate privatisation to foreigners or could block it. Even if managers had blocked privatisation initially, still it might have happened later, but this might not have involved foreign participation, and at the end managers may have turned up to be the new owners. Foreign buyers,

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[11] Here World Bank loans played a significant part in attempted restructuring of certain sectors. See for instance György-Vincze (1993) where it is shown that the Hungarian pharmaceutical industry saw the dawn of transition in a much more leveraged state than what is normally observed in industrial countries

usually firms in the same sector, were probably able to judge whether the company was worth to buy. Then putting aside bargaining problems the audited firm would have been sold to the firm having commissioned the audit. We can suppose also that managers derived some utility even from running nonviable enterprises, but they would have preferred to run viable enterprises. Also it can be assumed that managers derived some utility from selling the enterprise to foreigners as well. However, it might have also been the case that to run a viable enterprise would have needed appropriate leverage. So managers' decision problem must have been like the following: If I initiate a sale then I lose some private benefit, which is higher the more profitable the firm is, but profitability depends on acquiring the optimal leverage. If I do not initiate privatisation then I can enjoy some private benefits but how can I signal that the firm has good quality? The problem is that both viable and unviable firms' managers will be interested in not initiating a sale, but for completely different reasons. Indeed if the firm would need credit, or capital badly, the only feasible choice is to initiate the sale thereby giving sufficient incentives for banks to lend.

The story of early transition changes in banking and enterprise behaviour will probably always be a territory where empirical results will be few. It is pretty obvious that external financing of enterprises at the beginning of transition must have faced a number of serious problems. Clearly quick privatisation must have been a simple way to solve some of these, but certainly not all of them. Quick privatisation, however, was not forthcoming for many enterprises for various (political, distributional, perhaps efficiency) reasons. It is no great wonder then that bank lending to enterprises tended to decrease if profitability considerations were gaining prominence in banks' lending decisions. (At the current stage of financial market development bank lending should have been the main source of debt finance in these countries, and for some time to come. See Meyer (1989)). On the other hand, to get adequate financing large and politically well connected firms might have had less difficulties than other firms might. Thus as long as political lending motives were influential some enterprises might have had access to loans, even if their creditworthiness would not have had justified it. From a systemic point of view even many non-creditworthy enterprises must have had bank finance, due to creditor passivity that can be rationalised by „too many to fail" considerations. (See Mitchell (1995).)[12] This implies that after bank and loan consolidations financing decisions may have changed radically, and after bank privatisation further changes might have occurred. To substantiate these claims one would require observations on the character of enterprises (influential or not) that cannot be available for a large sample, and also reliable data for the early nineties, that could be found nowhere anymore.

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[12] Note that in the Czech Republic the form of corporate culture developed there has promoted bank financing of unprofitable enterprises for different reasons.

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