

CAPITAL STRUCTURES IN EMERGING STOCK MARKETS: THE CASE OF HUNGARY

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This paper studies developments in the Hungarian capital markets during 1992–95 and investigates the determinants of the capital structures of companies listed on the Budapest Stock Exchange. Hungarian companies had very low leverage ratios. Empirical findings indicate that the negative relationship between leverage and proportion of tangible assets was primarily caused by the lack of long-term debt financing. The relationship between leverage and the size of the company provides some indication of the importance of trade credits for the companies. The more profitable companies had less debt than less profitable ones. This is attributed to the firms' financial incentives aggravated by the segmentation of Hungarian credit markets and credit rationing within the financial environment. Manufacturing firms and firms with the state among their major shareholders enjoyed higher levels of debt financing relative to other companies.

I. INTRODUCTION

WHAT are the key financial and organizational factors determining the quality of restructuring and adjustment of privatized companies in transition economies? The importance of this question becomes clear once it is realized that macroeconomic stabilization cannot be achieved without the proper microeconomic environment. Capital markets, along with the rules and regulation governing these markets, are integral parts of this environment. Managers, owners, and other suppliers of finance who interact in these markets should be provided with the proper incentives and instruments to improve the economic efficiency of their firms. A large number of factors distort these incentives and reduce the set of available instruments even in the developed countries. The endogenous formation of new economic systems in transition economies makes it virtually impossible to mitigate all market imperfections at once.

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This paper contributes to the scarce literature on the financing of firms in the transition economies by examining the various ways by which firms listed on the Budapest Stock Exchange during 1992–95 were financed. I reexamine, refine, and extend the findings of a previous paper on the capital structures of Hungarian companies by Cornelli, Portes, and Schaffer (1996) (hereafter referred to as CPS). The authors start by developing a theoretical framework for analyzing the firm's optimal capital structure in transition and proceed by examining the actual capital structures of a large set of nonfinancial companies in three Central and Eastern European countries (CEECs): the Czech Republic, Hungary, and Poland. Finally, the authors conduct an empirical test of the determinants of capital structure using accounting statements of Hungarian companies.

The major advantage of this paper relative to CPS is the availability of market data for the Hungarian companies, which was unavailable in the CPS study. Using market data makes my empirical results more closely related to the theoretical predictions of the optimal capital structure literature.

Moreover, this paper differs from CPS in several other important aspects. In contrast to CPS, I focus on one country and begin by describing the structure of the Hungarian financial sector and the economic environment during the time under investigation, which helps to clarify the later findings. I continue by reexamining the empirical results of CPS using a smaller sample of traded companies and checking whether the fact of stock exchange listing changes the capital mix of the companies and the determinants of capital structure. I also refine the proxies for financial leverage used by CPS and examine whether (and how) they affect the results of empirical models.

Observing whether the capital structures of listed companies are different from the rest of the economy and analyzing the nature of these differences gives some insights into the role of the stock market at a relatively early stage of financial development (Booth et al. 2001) and contributes to the theoretical discussion on the role of security markets in transition.

Views on the last issue differ widely in the economic literature.¹ The discussion is centered on two stylized alternatives for the financial system: “bank-based” or “market-based.”² The main issue in the competing arguments is the informational efficiency of these two systems in optimal resource allocation. For firms, differences in institutional arrangements result in differences in the availability and costs of alternative sources of funding. Moreover, institutional differences affect ownership structures and creditor-firm relationships, and thereby the returns on various projects. Finally, from a dynamic perspective, the alternative systems have different susceptibilities to crises and abilities to recover from economic downturns. Given

¹ Corbett and Mayer (1991) and Grosfeld (1994) provide competing arguments on the issue.

² Mayer (1990) analyzes the forms of financing underlying this distinction.

the fundamental political and economic changes taking place in the transition economies, they are presented with a unique opportunity to choose among competing models to reform their economic systems.

Although “institutional restructuring” is an integral part of the transition process, it is not the only part. The other stylized steps are “stabilization” and “liberalization” (Anderson and Kegels 1998). Stabilization relates to coping with the systemwide shocks experienced in the reform process. The main contributors to these shocks are price liberalization, changes in the state budget, the breakup of the system of foreign trade, and monetary overhang. Liberalization, at least in our context, involves the withdrawal of the state from substantial segments of the economy and the introduction of liberal principles of economic and financial activity. In other words it involves the decentralization of decision making in the economy.

The relative success or failure of the country in the above three phases of reforms—stabilization, liberalization, and institutional restructuring—influences the resource allocation in the economy and companies’ sources of financing in particular. A number of recent papers (Cornelli, Portes, and Schaffer 1996; Hussain and Nivorozhkin 1997) report that the companies in CEECs have much lower leverage than their counterparts in the G7 countries. Cornelli, Portes, and Schaffer (1996) argue that the lack of debt financing can be detrimental to the investment and growth of companies. Hussain and Nivorozhkin (1997) argue (for Poland) that low leverage ratios point to a growing stock market and an obvious reluctance of banks to grant loans to old and risky firms. Both papers attribute the low levels of debt financing to the supply side of the market, which causes credit rationing. To some extent, credit rationing can be a positive phenomenon since the balance of powers between firms and banks is often not clear. Banks and firms have only recently become subject to hard-budget constraints, their incentives are likely to be distorted, and it is often the government that bears the downside risk.

The remainder of the paper is organized in the following manner. Section II describes the economic environment and the financial sector in Hungary during the first half of the 1990s. Section III sets up an empirical model, describes the underlying theories, and analyzes the results. Section IV is the conclusion.

II. THE HUNGARIAN FINANCIAL SECTOR

Although the two-tier banking system was created in Hungary as early as 1987, the size of the banking sector did not change substantially until 1990,³ when the number of financial institutions increased dramatically due to the entry of domestic and

³ This section draws on U.S. Department of Commerce (1996) and Anderson and Kegels (1998).

foreign private banks.⁴ Despite the entry of new banks, the structure of the banking sector remained very concentrated.⁵ The state-owned banks were responsible for the majority of banking activities, with the National Savings Bank accounting for 70 per cent of total banking sector assets in 1994. The state was also directly and indirectly involved in the ownership of the largest banks.⁶ The privatization of Hungarian banks began only in 1994.

In 1992 the government started to introduce new banking laws and regulations that substantially tightened the regulatory environment.⁷ Hungarian banks were recapitalized to a large degree by 1994. In June of that year, major banks reached a capital to assets ratio of 4 per cent with an end-of-year target of 8 per cent.

All through the period I consider, the Hungarian Central Bank (The National Bank of Hungary, NBH) was using the refinancing of credits granted by the commercial banks to promote either investments in specific economic sectors or activities such as exporting and privatization. The share of long-term loans decreased but, in the middle of 1994, long-term refinancing still amounted to approximately 31 per cent of long-term credit to the private sector.⁸

According to a number of authors (Dittus 1994; Anderson and Kegels 1998), the changes in Hungary's balance of payments, foreign debt, and developments in the government budget also had a significant effect on the growth of enterprise credit. All through the period under investigation, Hungary was overburdened with a large amount of foreign debt. The developments in the balance of payments called for changes in the monetary policy of the Hungarian government. With the objective of maintaining currency stability, the government expanded its budget deficit, leading to a crowding-out effect on enterprise credit: "Since 1990 credit to the public entities, local and national governments, has increased rapidly. In contrast, credit in enterprises has not kept pace and actually fell in nominal terms in 1992 and 1993." (Anderson and Kegels 1998, p. 91)

Another striking feature of the Hungarian credit market in the first half of 1990s was the downward-sloping term structure of interest rates on loans. Although it

⁴ The number of commercial banks increased from 16 in 1989 to 23 in 1990, and reached 35 by 1996. Joint ventures and foreign-owned financial institutions tripled from 3 in 1989 to 9 in 1990 and continued to rise, reaching 23 by 1996.

⁵ As of December 1993, the six largest banks accounted for 44.9 per cent of the capital, and 69.8 per cent of the deposits of the forty largest banks.

⁶ Indirect ownership involved even the medium-sized commercial banks due to the presence of the state-owned enterprises among their shareholders.

⁷ Until mid-1993, Hungary followed a policy of taking bad loans off the balance sheet of banks and putting them into a separate organization. Later, it switched to a policy of bank recapitalization and letting banks deal with the loans themselves.

⁸ The banks were also able to obtain credits from the NBH when the funds were directed for investment purposes and were secured by foreign exchange deposits. These loans paid interest equal to the base lending rate of the NBH. This type of refinancing credits amounted to 13 per cent of the long-term credit granted to the private sector at the end of June 1994.

TABLE I
HUNGARY: KEY INDICATORS

Indicator	1991	1992	1993	1994	1995
Lending rate (average)	35.1	33.1	25.4	27.4	32.6
Discount rate (end of period)	22.0	21.0	22.0	25.0	28.0
Change in PPI (%)	24.8	13.4	10.2	14.9	31.3
Change in CPI (%)	32.2	25.1	21.1	21.2	28.3
GDP growth (%)	-12.0	-3.0	-0.6	2.8	1.5
Current account (U.S.\$ million)	403	352	-4,262	-4,054	-2,535
Exchange rate index (1995 = 100)	167.6	158.4	136.5	119.0	100.0

Sources: IMF (1999) and Hungarian Central Statistical Office.

TABLE II
HUNGARY: EQUITY MARKET

Indicator	1991	1992	1993	1994	1995	1996
Number of listed companies	21	23	28	40	42	45
Market capitalization (U.S.\$ million)	505	562	812	1,604	2,399	5,273
Trading value (U.S.\$ million)	117	38	99	270	355	1,641
Turnover ratio		6.3	14.2	21.6	17.3	41.6
Local index: BSE BUX ^a (Jan. 2, 1992 = 1,000)	837.6	890.9	1,264.1	1,470.1	1,528.9	4,134.3

Source: International Finance Corporation (1997).

Note: End-of-period levels.

^a BUX stands for the Budapest stock index which is calculated from the average market price values of BUX basket securities.

could indicate an expected decrease in the inflation rates, it is still difficult to explain the negative spread between average long-term credits and deposits during some years. One plausible explanation is a segmented credit market. The government's refinancing credits, as described earlier, likely distorted the credit markets and resulted in credit rationing and large differentiation in interest rates.

During most of the period I consider, bank lending to the business sector was decreasing. The contraction of overall economic activity during half of that period (see Table I) may indicate that it was a demand side phenomenon. However, during that same time, the business sector substantially increased its foreign borrowings (Anderson and Kegels 1998).⁹

Hungary made an early effort to create financial markets. The Budapest Stock Exchange (BSE) opened on June 21, 1990. Despite initial optimism, share trading and turnover was low (see Table II).

⁹ The same authors argue that the behavior of the banks during the 1990-94 period was affected by the desire to improve the quality of their assets and the necessity to meet the risk-based capital standards.

The market lacked both investment opportunities and investors. By the end of 1990, only six equities and no government securities were being traded on BSE. Equity trading was hindered by the common emerging market problems of low liquidity, small market size, limited opportunities for diversification, nonconvertible currency, lack of transparency, and macroeconomic and currency risks. In the first half of the 1990s, the Hungarian stock market was relatively small, in both size and capital, relative to other Central European markets. Capitalization on the BSE rose steadily (see Table II) but still lagged behind Warsaw and Prague.

III. CAPITAL STRUCTURE: EMPIRICAL FINDINGS

A. *The Data*

The data employed in this study consists of accounting and market data for twenty-five nonfinancial companies listed on Budapest Stock Exchange during the period 1992–95. The data was obtained from the Financial Times Extel Database (1996). This database contains comprehensive information for over 12,000 companies all over the world. Among other things, it provides balance sheets, profit and loss accounts, and market data. I selected for analysis all Hungarian nonfinancial companies¹⁰ available in the Extel database, covering about 90 per cent of all listed firms in Hungary as of 1993. This is a reasonable and sizable sample representation of the overall stock market.

The balance sheet and profit and loss data is available for the period 1992–95. The data on market capitalization of companies is available for the period 1993–95.

B. *Descriptive Analysis*

Let us first examine the structure of the balance sheets of Hungarian firms in the sample and compare them to what was previously found for industrialized countries. One must bear in mind that this comparison is not completely valid because of bias in industry representation in the Hungarian sample. Moreover there is a potential downward bias in the book value of fixed assets due to inflation. The risk related to the mismatch of the market value of assets and their historical costs on the balance sheet is relatively small in my sample, since the companies were likely the subjects of detailed examination and revaluation prior to privatization and listing. The data set allows us to observe the dynamics of capital structure changes and to see the direction and the extent of the adjustments.

On the asset side, compared with Germany and Italy, the Hungarian firms appear to be similar to Anglo-American economies in that they have proportionately more fixed assets and fewer current assets in their balance sheets (see Table III). A simple

¹⁰ Since the balance sheets of banks have a strikingly different structure than those of nonfinancial companies, I excluded banks from the sample.

TABLE III
STRUCTURE OF THE BALANCE SHEETS

	Hungary		U.K. 1991	U.S.A. 1991	Germany 1991	Italy 1991
	1992	1995				
Assets:						
Cash and short-term investments	12.03	8.70	11.4	11.2	8.8	10.5
Account receivables (debtors)	18.16	17.73	22.1	17.8	26.9	29.0
Inventories	15.78	18.22	17.7	16.1	23.6	15.6
Current assets—total	54.75	47.58	54.7	48.0	59.4	56.5
Fixed assets (tangible)	37.44	41.84	41.3	36.3	32.7	32.4
Liabilities:						
Debt in current liabilities	10.80	11.88	9.6	7.4	9.9	16.2
Current liabilities—total	36.29	31.09	40.0	33.4	30.0	43.2
Long-term debt	2.46	3.72	12.4	23.3	9.8	12.1
Liabilities—total	42.00	39.04	57.8	66.1	72.0	67.4
Shareholders equity	58.00	60.96	42.2	34.1	28.0	32.6

Source: Figures for listed companies in the United Kingdom, the United States, Germany, and Italy are from Rajan and Zingales (1995).

Note: The value of each item is calculated as a fraction of the book value of total assets and then averaged across all firms.

investigation of the composition of liabilities reveals some interesting differences between Hungary and the group of industrialized countries. The share of short-term debt exceeds that of all countries except Italy, and shareholders' funds are by far larger than in the United Kingdom, the United States, Germany, and Italy. Long-term debt, on the other hand, is almost absent from the balance sheets of Hungarian companies. Moreover, the composition of assets and liabilities did not change substantially between 1992 and 1995.

Although the composition of assets and liabilities on the balance sheet does provide some initial insights into the capital structures of listed firms in Hungary, I proceed by examining the financial leverage of these companies in greater detail.

The results in Table III indicate that the companies in my sample have, on average, much lower leverage than was found by CPS.¹¹ The ratio of debt over total

¹¹ There are several reasons why average leverage ratios for listed companies in my sample might differ from the ones obtained by CPS. One reason is that stock exchange listing may alleviate the informational asymmetries and moral hazard issues between firms and suppliers of external finance (Johnson and Shleifer 2001). The listed firms could also rely relatively more heavily on equity due to their better ability to issue new shares (Booth et al. 2000). The other reason is that the firms' characteristics influencing the choice of leverage (i.e., size, profitability, etc.) may differ between listed and unlisted companies. Various factors may counterplay, and therefore it is hard to form any prior expectations on the direction of the differences. Moreover, one should keep in mind that the comparison of the average leverage ratios in my sample with the corresponding ones in CPS is not a formal statistical test. Cornelli, Portes, and Schaffer (1996) used data from the World Bank Research Project on Enterprise Behavior and Economic Reform. Unfortunately their data set

TABLE IV
HUNGARY: LEVERAGE RATIOS

Ratios	Mean	Median	Standard Deviation	Minimum	Maximum
1992					
Debt to total assets	0.13	0.12	0.11	0.00	0.39
Debt to capital	0.19	0.21	0.14	0.00	0.56
Nonequity liabilities to total assets	0.42	0.39	0.20	0.09	0.93
1993					
Debt to total assets	0.16	0.13	0.14	0.00	0.55
Debt to capital	0.21	0.21	0.17	0.00	0.73
Nonequity liabilities to total assets	0.42	0.41	0.18	0.06	0.75
1994					
Debt to total assets	0.13	0.09	0.12	0.00	0.46
Debt to capital	0.17	0.14	0.15	0.00	0.50
Nonequity liabilities to total assets	0.37	0.38	0.16	0.07	0.74
1995					
Debt to total assets	0.16	0.13	0.13	0.00	0.48
Debt to capital	0.20	0.21	0.16	0.00	0.59
Nonequity liabilities to total assets	0.39	0.40	0.15	0.06	0.68

assets was on average 14.5 per cent during the period 1992–95 (see Table IV). Cornelli, Portes, and Schaffer (1996) report a debt to total asset ratio of 32 per cent for their sample of Hungarian firms at the end of 1992. They compare the result to the ratio of nonequity liabilities to total assets of 66 per cent reported by Rajan and Zingales (1995) for G7 countries. The debt to asset ratio reported by Rajan and Zingales was in fact only 28 per cent. Therefore it seems that what CPS claim as the debt to total assets ratio is in fact the ratio of nonequity liabilities to total assets. I obtain a figure of 42 per cent for the ratio of total nonequity liabilities to assets for Hungary in 1992 (see Table IV). The average value of the ratio of total nonequity liabilities to assets during 1992–95 was 40 per cent. Table IV reports the ratio of debt to book value of capital analogous to the one reported by Rajan and Zingales for G7 countries. The difference between these ratios is even larger; 41 per cent for G7 countries versus 19 per cent in Hungary.

Cornelli, Portes, and Schaffer (1996) also use the ratios of long- and short-term bank debt to assets. Those proxies are probably closely related to the share of debt financing, but may understate its amount since the banks are not the only providers of debt. The long-term debt to assets ratio obtained by CPS was 2.0 per cent while the short-term debt to assets ratio was 7.3 per cent at the end of 1992. The short-

was not available, so I could not perform a formal comparison of the listed companies in my sample with the wider population of firms in CPS.

term debt to assets ratio for the corresponding period in this study was 10.8 per cent, and the long-term debt to assets ratio was 2.5 per cent, respectively.

The results above indicate that listed companies in Hungary appeared to be substantially less leveraged than their counterparts in G7 countries. The ratios remained low throughout the period with a uniform drop in 1994 and the following return to 1993 levels. Moreover, the comparison of median values indicates that there are also differences in the cross-sectional distribution of these ratios. G7 firms are skewed toward larger leverage while Hungarian companies tend to have smaller-than-average median leverage values. Comparison with a larger population of nonfinancial firms in Hungary used in CPS is hindered, as mentioned above, by the fact that CPS use nonequity liabilities and bank debt as proxies for debt financing. Although the ratios of these indicators are often used in studies of capital structures, they tend to bias the financial snapshot of the companies. Nonequity liability ratios have the deficiency that they overstate the amount of leverage, while the use of bank debt alone may understate it.¹² The overall picture that emerges after taking these biases into account shows that the listed companies in Hungary had on average rather similar levels of financial leverage to the general population of firms.

One also notes a big gap between short- and long-term debt financing in the balance sheet of Hungarian firms. As shown in Table III, the average debt in current liabilities in Hungary was greater than in all G7 countries except Italy. Therefore, an extremely low level of long-term debt financing explains the generally small ratios.

The natural question that arises is why do we observe such low ratios? The answer could be obtained by employing some combination of demand and supply side considerations.

On the demand side, firms have an incentive to increase their leverage to shield income from taxes, which are rather high in the CEECs relative to Western countries.¹³ However, this “income shielding” policy has to be implemented *ex ante*—before the income is received. Therefore, we should think in terms of the expected realizable value of the tax shield, which varies depending on the characteristics of a company. In particular, tax considerations would be most relevant for highly profitable firms with stable incomes. In general, a firm faces the trade-off between the tax deductibility of interest payments and the costs of the potential financial distress due to the inability to pay interest on debt. High demand and price uncertainty in transition economies like Hungary suggests that companies would rationally prefer to retain a higher liquidity in order to protect themselves against random shocks to income, rather than using debt to shield future incomes.

It is often argued that low bankruptcy costs due to inefficiencies in the legal

¹² I will discuss the choice of leverage proxies in the next section.

¹³ Cornelli, Portes, and Schaffer (1996) report the total tax over GDP ratio in CEECs as 40–50 per cent, and give high profit tax rate.

systems of emerging markets and potential government bailouts provide an incentive for taking on more debt. On the other hand, these incentives might be weak (especially in a sample of private companies) because of the unwillingness of companies' management to lose their jobs as a result of financial distress. The possibility of bailout, though, should still be relevant for companies involved in government programs and having the State among their shareholders.

On the supply side, the factors listed in Section II of this paper contributed to the reluctance of banks to lend. These factors include active government involvement in the credit allocations, the more stringent regulation and supervision of banks, and the crowding-out effect of government debt. The overall effect of the policies was the segmentation of credit markets, with preferential treatment given to some groups of borrowers and the credit rationing imposed on others. Dittus (1994) quotes the National Bank of Hungary as stating, "banks have become prudent in their lending. . . . Owing to the credit crunch, [net domestic credit] has increased at a rate much lower than would have been permissible."

So far, I have provided an explanation of the low average level of indebtedness of Hungarian firms. The more interesting issue would be to explain the cross-sectional heterogeneity of capital structures. Financial theory provides us with a set of stylized facts regarding the determinants of the financial leverage of firms. In the following section I highlight some theories, which could be relevant for this study.

C. *Theoretical Arguments on Capital Structure*

Optimal financial leverage has been a central issue of corporate finance ever since Modigliani and Miller (1958) showed that capital structure is irrelevant to a firm's value when assets, earnings, and future investment opportunities remain constant. That statement seems to be contradictory until we look more closely at the "irrelevance" statement. What it really means is that there is no "magic" role for leverage as long as we consider a taxless, frictionless world. Therefore, the capital structures observed in the real world should reflect taxes or specifically identified market imperfections. Economic theories try to identify and explain these imperfections.

The static trade-off theory of capital structure explains observed capital structures, as its name implies, as a static trade-off of costs and benefits of debt. The tax deductibility of interest payments induces the firm to borrow to the margin where the present value of interest tax shields is just offset by the value losses due to the agency costs of debt and the possibility of financial distress. Among other things, this theory predicts a positive relationship between tangible assets and financial leverage and between profitability and financial leverage. The former insight is based on the argument that the cost of financial distress is the most serious for "growth" firms with higher proportions of intangible assets. The later stems from

the presence of interest tax shields, which become increasingly important with higher profits.

One has to keep in mind that the static trade-off theory does not imply a stable equilibrium. Random shocks would likely keep the firm away from its optimal capital structure. Transaction costs could also play an important role in delaying convergence to a target leverage level. Although these factors are often assumed to be of second-order in the studies of developed economies, they may be relatively more important in the study of transition economies.¹⁴

According to *the pecking order theory*: (1) dividend policy is “sticky”; (2) firms prefer internal to external financing; (3) debt is used before equity as external financing; and (4) in choosing the sources of financing the firm follows the pecking order of securities, from safe to risky debt, possibly to convertibles and other quasi equity instruments, and finally to equity as a last resort (Myers 1989).

In contrast to the static trade-off theory, the pecking order theory does not clearly define any target debt ratio. The central issue of the theory is a choice between internal and external sources of financing.

The particular scenario offered by the pecking order theory can be viewed both as a consequence of an agency problem (moral hazard) and of asymmetric information. According to the first explanation, corporations rely too much on internal funds for control reasons and/or to avoid the discipline effect of capital markets (external financing). This story indeed has some rationality, but “managerial entrenchment” is not a primary factor influencing the choice of financing. Myers and Majluf (1984) showed that even if a manager acts in the interests of existing shareholders, she would rationally prefer internal finance to external funds. The cost of outside financing is greater because a manager has superior knowledge about his or her company, and outside investors rationally account for this by discounting the firm’s securities. This theory predicts a negative relationship between profitability and leverage.

D. *Regression Analysis*

One of the striking results of this study is the extremely low level of long-term debt on the balance sheets of the companies. Closer inspection of the data reveals that for every year during 1992–95, about 40 per cent of the companies in the sample did not have any long-term debt (see Table V).

The logical question arising from this observation is whether there are differences observed between companies with and without long-term debt. I tested the differences in the means for two subgroups across four dimensions—tangibility,

¹⁴ Banerjee, Heshmati, and Wihlborg (1999) find evidence of a very slow adjustment of companies’ leverage to a target in the sample of U.S. and U.K. companies, suggesting that these factors are not of second-order.

TABLE V

T-TEST OF MEAN DIFFERENCES FOR COMPANIES WITH NO LONG-TERM DEBT VERSUS ALL OTHERS

	No. of Companies	<i>TANG</i> ^a (Mean, std.)	<i>T</i> -stat.	<i>PROF</i> ^b (Mean, std.)	<i>T</i> -stat.	<i>SIZE</i> ^c (Mean, std.)	<i>T</i> -stat.	<i>GROW</i> ^d (Mean, std.)	<i>T</i> -stat.
1992 <i>LTD</i> ^e = 0	11	0.31 (0.22)	-1.53	0.033 (0.12)	-1.10	6.37 (1.28)	-1.87*		
<i>LTD</i> = 1	14	0.43 (0.18)		0.080 (0.08)		8.21 (0.99)			
1993 <i>LTD</i> = 0	10	0.34 (0.19)	-1.56	0.070 (0.11)	0.71	7.50 (1.45)	-1.40	1.60 (1.25)	0.84
<i>LTD</i> = 1	15	0.46 (0.18)		0.041 (0.09)		8.21 (0.93)		1.28 (0.50)	
1994 <i>LTD</i> = 0	10	0.32 (0.16)	-1.61	0.081 (0.10)	-0.16	7.31 (1.35)	-2.15**	2.27 (3.77)	1.14
<i>LTD</i> = 1	15	0.43 (0.18)		0.065 (0.06)		8.36 (1.07)		1.16 (0.30)	
1995 <i>LTD</i> = 0	7	0.35 (0.20)	-1.18	0.06 (0.04)	-0.45	7.40 (1.28)	-1.63	1.02 (0.63)	0.41
<i>LTD</i> = 1	18	0.45 (0.17)		0.07 (0.06)		8.37 (1.47)		0.95 (0.30)	

^a The ratio of tangible fixed assets to total assets.

^b The ratio of earnings before interest and tax to total assets.

^c The logarithm of turnover.

^d A market to book ratio calculated as the book value of assets minus the book value of equity plus the market value of equity divided by the book value of assets.

^e The ratio of long-term debt to total assets.

* Significant at 10 per cent level.

** Significant at 5 per cent level.

profitability [current (*PROF*) and future (*GROW*)], and size. The statistical significance of the results is rather weak given the small sample size, but there are some interesting patterns in the relationship between the two groups of companies. It appears that the companies with long-term debts have a consistently higher proportion of tangible fixed assets. The difference is marginally insignificant, but *t*-statistics are negative for all years. The results for the profitability variable (*PROF*) are mixed. The difference is not significant, but the sign of the *t*-statistic changed from negative to positive in 1993. I also use the proxy (*GROW*) for future profitability, as measured by market to book ratio. The means of companies without debt are consistently higher, but not significantly so. It suggests that the absence of long-term debt is positively priced in the market. The size of the companies measured by the logarithm of turnover (*SIZE*) is greater for the companies with long-term debts, and significantly so in two out of four years.

The overall results suggest that there may be some nonfinancial factors as well as industry factors determining the access to the long-term financing, which I plan to investigate in the regression analysis.

My model takes the following form:

$$LEV_{it}^J = X_{it}\beta + \alpha + \varepsilon_{it},$$

where $i = 1, \dots, 25$ is the number of firms in the sample and $t = 1, \dots, 4$ (or $t = 1, 2, 3$) is the number of years of observations.

LEV_{it}^J is the vector of leverage proxy J for company i in the year t , and X_{it} is a matrix of explanatory variables for company i in the year t . α is an intercept of the regression equation and ε_{it} is an independently and identically distributed statistical error. In addition, the coefficient estimates are common for the whole sample.

The model includes the following explanatory variables:

- TANG*: The share of tangible fixed assets as a proportion of total assets,
- PROF*: The return on assets measured by earnings before interest and tax to total assets,
- SIZE*: The logarithm of turnover,
- GROW*: Market to book ratio defined as the book value of assets minus the book value of equity plus the market value of equity divided by the book value of assets,
- STATE*: Dummy variable equal to 1 if the State Property Agency (SPA) was listed among major shareholders of the company, and otherwise 0,
- MAN*: Dummy variable equal to 1 if the major activity of the company was “manufacturing” and otherwise 0.

Next, I will describe the choice of leverage proxies.

I have already mentioned that in their paper, CPS use the ratio of total nonequity liabilities to total assets as a proxy for the leverage of firms. This proxy (to some extent) contradicts their discussion on the role of the “monitored” debt in the companies’ financing, since the leverage ratio is influenced by alternative credit sources such as gross trade credits.¹⁵ Despite the fact that trade credits could have been used in Hungary as a mean of financing as opposed to purely for transaction purposes, the ratio of total liabilities is likely to overstate the amount of financial leverage. Alternative leverage proxies such as the ratio of total debt to total assets do not completely solve the problems mentioned above. An increase in gross trade credit, for example, would result in a decrease of this measure of leverage.

In addition, the credit rationing environment in Hungary, which I described previously, would likely result in a lack of debt but not of trade credit. Therefore it is possible that the credit-rationed companies *substituted* the “missing” short-term debt with higher trade credits. As a result, the factors I use to explain the compa-

¹⁵ Pension liabilities could be another source of “noise.”

nies' leverage would have opposite effects on different parts of nonequity liabilities.

The common view in the literature (see Rajan and Zingales 1995) is that the ratio of total debt to capital (defined as total debt plus shareholders' equity) is the best proxy for leverage.¹⁶

In comparing my results to the ones obtained by CPS, I use the ratios of both "debt" and "liabilities" to total assets. In addition I use the ratio of debt to capital. The book value model uses the time period from 1992 to 1995. For the market values, the period under investigation is 1993–95.

E. *Results*

In the following section I will describe the theories underlying the expected relationship between financial leverage and the explanatory variables of the model, and will also report on and interpret the results.

1. *Current and future profitability*

Financial theory can explain both negative and positive relations between a firm's profitability and its financial leverage. A simple version of the pecking order theory (Myers and Majluf 1984) predicts that, holding investments fixed, leverage is lower for more profitable firms, and given profitability, is higher for firms with more investments. Myers (1984) presents a more complex view of the pecking order argument, where firms are concerned with both future and current financing costs. Taking these costs into account, firms with large expected investments may want to maintain a low-risk debt capacity in order to avoid passing up future investments and/or financing these future investments with new risky securities.

An important challenge of the pecking order theory is to explain whether firms with investments that are persistently larger than earnings can maintain low leverage.¹⁷ A part of the answer to that question lies in the dividend policies of the firms. According to the theory, firms that pay dividends can maintain a low payout ratio, while firms that do not pay dividends can refuse to start paying them when earnings are strong (Fama and French 2000).¹⁸ Another potential answer, which is especially relevant for newly listed Hungarian companies in this study, is that firms going public may issue increased equity in anticipation of future investments.

The alternative theory of Jensen (1986) employs the argument that profitable firms may signal their quality by increasing their leverage. This of course would result in a positive relationship between leverage and profitability. In the context of

¹⁶ At least it is the best reflection of the past financing decisions of the companies (Rajan and Zingales 1995).

¹⁷ I would like to thank an anonymous referee of the journal for pointing out this issue.

¹⁸ The effect of the dividend policy is not investigated in this paper given the unavailability of data and the limited sample size, but future research is warranted.

TABLE VI

MODEL 1: DEPENDENT VARIABLES—DEBT TO BOOK VALUE OF ASSETS AND NONEQUITY LIABILITIES TO BOOK VALUE OF ASSETS, 1992–95

Dependent Variable	Intercept	TANG	PROF	SIZE	STATE	MAN	R ²	Adj. R ²
Total liabilities /								
total assets	0.419***	-0.372***	-0.916***	0.014	0.033	0.084**	0.342	0.307
Standard error	(0.093)	(0.082)	(0.180)	(0.012)	(0.041)	(0.033)		
Prob > T	0.000	0.001	0.001	0.237	0.428	0.012		
Total debt / total assets								
	0.204***	-0.057	-0.512***	-0.008	0.042	0.123***	0.257	0.217
Standard error	(0.074)	(0.065)	(0.142)	(0.009)	(0.033)	(0.026)		
Prob > T	0.007	0.385	0.000	0.378	0.206	0.000		
Short-term liabilities /								
total assets	0.374***	-0.480***	-0.613***	0.019*	0.040	0.059**	0.377	0.344
Standard error	(0.086)	(0.076)	(0.165)	(0.011)	(0.038)	(0.030)		
Prob > T	0.000	0.000	0.000	0.082	0.291	0.050		
Short-term debt /								
total assets	0.224***	-0.104***	-0.306**	-0.012	0.047	0.090***	0.220	0.178
Standard error	(0.065)	(0.057)	(0.125)	(0.008)	(0.029)	(0.023)		
Prob > T	0.000	0.071	0.016	0.146	0.109	0.000		
Long-term liabilities /								
total assets	0.045	0.108***	-0.303***	-0.005	-0.007	0.025**	0.271	0.232
Standard error	(0.035)	(0.031)	(0.068)	(0.004)	(0.016)	(0.012)		
Prob > T	0.207	0.001	0.001	0.260	0.641	0.049		
Long-term debt /								
total assets	-0.020	0.047*	-0.206*	0.004	-0.005	0.032***	0.175	0.131
Standard error	(0.030)	(0.030)	(0.060)	(0.000)	(0.010)	(0.010)		
Prob > T	0.519	0.090	0.001	0.346	0.729	0.004		

* Significant at 10 per cent level.

** Significant at 5 per cent level.

*** Significant at 1 per cent level.

a transition economy like Hungary, the negative relationship between leverage and profitability predicted by the pecking order theory is more likely to be true, although some modifications are warranted.¹⁹

The arguments described above involve the demand side. It is likely that the supply side imperfections described in detail earlier in the paper further increase the incentive for profitable firms to rely on internal financing or equity before turning to debt.

According to this survey, more profitable firms have lower leverage (see Tables VI and VII). The relationship is strong and holds in all specifications of the model.

¹⁹ For example, an increase in common equity may not be subject to asymmetric information when the equity is issued to the employees of the company. This is the case for some firms in my sample.

TABLE VII
 MODEL 2: DEPENDENT VARIABLES—DEBT TO BOOK VALUE OF CAPITAL, 1992–95

Dependent Variable	Intercept	<i>TANG</i>	<i>PROF</i>	<i>SIZE</i>	<i>STATE</i>	<i>MAN</i>	<i>R</i> ²	Adj. <i>R</i> ²
Total debt / capital	0.236**	-0.151*	-0.751***	-0.001	0.047	0.149***	0.261	0.222
Standard error	(0.092)	(0.081)	(0.177)	(0.012)	(0.041)	(0.032)		
Prob > T	0.012	0.065	0.000	0.913	0.255	0.000		
Short-term debt / capital	0.283***	-0.184**	-0.547***	-0.010	0.053	0.126***	0.243	0.202
Standard error	(0.085)	(0.076)	(0.165)	(0.011)	(0.038)	(0.030)		
Prob > T	0.002	0.016	0.001	0.362	0.170	0.000		
Long-term debt / capital	-0.053	0.039	-0.411***	0.011	-0.006	0.055***	0.178	0.134
Standard error	(0.054)	(0.047)	(0.104)	(0.007)	(0.024)	(0.019)		
Prob > T	0.327	0.413	0.000	0.105	0.787	0.005		

* Significant at 10 per cent level.

** Significant at 5 per cent level.

*** Significant at 1 per cent level.

This is in line with what is found for industrialized countries (Long and Malitz 1985; Titman and Wessels 1988; Rajan and Zingales 1995; Fama and French 2000) and with the evidence from the transition economies (Cornelli, Portes, and Schaffer 1996; Hussain and Nivorozhkin 1997).

The pecking order theory's argument on asymmetric information seems to be able to (at least partially) explain the observed relationship. Despite the potentially positive effect of profitability on the supply side of credit, profitable firms rationally prefer to rely on internal funds. This is so because they anticipate higher costs for external debt funds due to informational asymmetries and bankruptcy costs, aggravated, in the case of Hungary, by the crowding-out effect of government debt and the problem of adverse selection (U.S. Department of Commerce 1999).

The results also indicate that stock shares might have served as an alternative source of financing for profitable listed firms in Hungary. The coefficient of profitability was significant and negative in unreported regressions using debt to paid-up capital as a dependent variable. The increasing foreign direct investment flows in Hungary can help to explain the observed relationship (OECD 2000; Kaminski and Riboud 2000).

I use a market to book ratio as a proxy for growth opportunities (future profitability). Firms with higher expected growth can be expected to use a greater amount of equity finance, because lower leverage decreases the probability of passing up a profitable investment opportunity. As predicted by the theory (Myers 1977), the coefficient of the market to book ratio (*GROW*) is negative (see Table VIII). "Growth" firms can be expected to rely on internal funds and equity to a larger extent than "value" firms.

TABLE VIII

MODEL 3: DEPENDENT VARIABLES—DEBT TO MARKET VALUE OF CAPITAL, 1993–95

Dependent Variable	Intercept	TANG	GROW	SIZE	STATE	MAN	R ²	Adj. R ²
Total debt / capital	0.393**	-0.272*	-0.042**	-0.010	0.074	0.113**	0.166	0.104
Standard error	(0.155)	(0.137)	(0.016)	(0.018)	(0.065)	(0.046)		
Prob > T	0.014	0.050	0.012	0.562	0.255	0.016		
Short-term debt / capital	0.393***	-0.318**	-0.040**	-0.012	0.088	0.081*	0.179	0.118
Standard error	(0.148)	(0.130)	(0.015)	(0.017)	(0.061)	(0.045)		
Prob > T	0.010	0.017	0.011	0.493	0.156	0.077		
Long-term debt / capital	0.060	0.0413	-0.007	-0.004	-0.026	0.053**	0.084	0.0156
Standard error	(0.086)	(0.076)	(0.009)	(0.010)	(0.036)	(0.026)		
Prob > T	0.488	0.588	0.446	0.663	0.466	0.050		

* Significant at 10 per cent level.

** Significant at 5 per cent level.

*** Significant at 1 per cent level.

2. Tangibility

The next explanatory variable is the proportion of tangible fixed assets to total assets, i.e., *tangibility*. The stylized fact in the theory is that the proportion of tangible assets is positively related to the availability of collateral, which in turn may reduce the agency costs of debt.²⁰ The importance of collateral increases for newly established businesses which have no close ties to creditors. These arguments suggest a positive relationship between tangibility and the firm's leverage.²¹ Indeed, the results for developed countries (Rajan and Zingales 1995; Titman and Wessels 1988) uniformly confirm this.

On the other hand, there are a number of factors that limit the importance of tangible assets as collateral in the transition economies. First, underdeveloped and inefficient legal systems²² may hinder the creation of enforceable debt contracts. In cases of default, the recovery of collateral may be costly and lengthy. Second, a thin and illiquid secondary market for firms' assets creates uncertainty about their "recoverable" market value. Finally, an illiquid market for firm assets in the early stage of financial development may create a potential "holdup" problem (Grossman and

²⁰ This cost is related to the incentive of stockholders of leveraged firms to invest suboptimally in order to expropriate wealth from the firm's bondholders (Jensen and Meckling 1976; Myers 1977).

²¹ The alternative theory (Grossman and Hart 1982) is able to explain the negative relationship based on the argument that the increased amount of uncollateralized (more risky) debt would increase monitoring by lenders. That would alleviate the conflict of interest between the firm's shareholders and self-interested managers. Given well-publicized evidence of poor corporate governance structures in CEECs, I rule out this explanation of the relationship between tangibility and leverage.

²² For an overview of the legal system see the survey in *Business Central Europe*, December 1998.

Hart 1986)²³ thereby reducing the collateral value of tangible assets. Overall, the above factors suggest a weak or nonexistent relationship between tangibility and leverage in my model.

The results appear to be sensitive to the choice of leverage proxy. The relationships between tangibility and liabilities ratios are generally more significant than those between tangibility and debt ratios (see Tables VI, VII, and VIII). A higher tangibility of assets has a negative effect on companies' leverage in the regressions with total debt (total nonequity liabilities) and short-term debt (short-term liabilities). The coefficient of tangibility in the regression with long-term debt (long-term liabilities) is indeed positive. The negative relationship of tangibility with short-term debt (liabilities) dominates the positive relationship with the long-term debt (liabilities) in the regressions with total debt (liabilities). Again, these results are similar to what CPS obtained for the larger sample of Hungarian companies.

One way to interpret these results is to conclude that the tangible assets do play a role as collateral for long-term debts. Perhaps a more plausible explanation is the maturity matching of assets and liabilities by companies. Companies with a higher proportion of short-term, liquid assets rely on short-term debts, while the opposite is true for companies with a high proportion of tangible assets. Therefore, the virtual nonexistence of long-term debt financing results in the negative relationship between leverage and tangibility.

The negative relation between the tangibility of assets and leverage may also reflect the value of operational flexibility. The problem of adjusting to new economic conditions and discovering new markets was undoubtedly very severe for Hungarian companies. One can speculate that the modification of existing production (operations) was more difficult for companies with a large share of fixed assets, and required long-term financing.

3. *Size*

The stylized fact about the size proxy is that it should be inversely related to the probability of default. Moreover, the smaller costs of financial distress should result in a weaker correlation between size and leverage (Titman and Wessels 1988).

The plausible explanation that can be derived from my results deviates substantially from this stylized fact. The coefficients of size proxy are insignificant in all regressions, except in the one with short-term liabilities (see Tables VI, VII, and VIII). What is very interesting, though, is that the sign of the regression coefficient alternates depending on the proxy for leverage used.²⁴ The relationship is positive

²³ The "holdup" problem in our context refers to the fact that the company would rationally anticipate that the creditor (bank) will not foreclose on an asset because of its "specificity" to the company's operation.

²⁴ It should be noted that size correlates positively and strongly with profitability. I ran the models excluding one of the variables, but the direction and magnitude of results remained unchanged.

with nonequity liability ratios (in line with CPS's results) and negative with the debt ratios.

Total debt forms a portion of nonequity liabilities, with the remaining part consisting mostly of trade credits. What the results seem to indicate is that, to some extent, debt and trade credits are substitutes on the companies' balance sheets. Larger companies tend to have lower debt ratios but their nonequity liabilities ratios are higher due to their larger proportion of trade credits.

4. *Industry dummy*

The findings with respect to the effect of size and tangibility on leverage can potentially be influenced by the economic nature of companies' main activities. It was mentioned earlier that some companies may use trade credits as a substitute for debt financing. To account for that, I included in the model a dummy variable for manufacturing companies (*MAN*). According to the results, manufacturing companies had significantly higher leverage than all other companies in all specifications of the model (see Tables VI, VII, and VIII). I attribute this to the policies of the nonmanufacturing group of companies, which are primarily involved in the trade business. Higher competition and decreasing profit margins led them to choose low debt in order to maintain higher liquidity and keep existing market share (Financial Times Extel Database 1996).

These results should be interpreted with caution, since the majority of companies had more than one main activity. Therefore, the companies which I classified as manufacturing could in fact be carrying out activities across several nonmanufacturing areas.²⁵ In that case, the positive coefficient of the variable *MAN* could relate to the value of diversification (or vertical integration), with potentially more stable cash flows and the resulting availability of both long- and short-term debt as well as trade credits.

5. *The state ownership dummy*

I include the dummy variable *STATE* to account for the role of the direct ownership of the State Property Agency (SPA). This agency was created in March 1990 with the responsibility of supervising the privatization of public enterprises. The dummy variable is equal to one if the SPA was listed among the major shareholders of the company, and otherwise to zero.

The results provide some weak evidence that the presence of the state ownership positively affected the leverage levels of the companies (see Tables VI, VII, and VIII).²⁶

²⁵ To account for this, I need to know the percentage of sales (revenues) from each activity, which is not available for majority of the companies.

²⁶ The state ownership dummy was positive and significant in the model with the dependent variable of debt (liabilities) to paid-up capital.

The sign of the ownership dummy is positive in the regressions with short-term debt (liabilities) and negative in those with long-term debt (liabilities). The growing amount of short-term refinancing loans used by the Hungarian government to support selected firms, as mentioned in Section II of this paper, may be responsible for this finding.

IV. SUMMARY AND CONCLUSIONS

In this paper I have undertaken a detailed study of developments in the Hungarian capital markets during 1992–95, and investigated their impact on the capital structures of companies listed on the Budapest Stock Exchange.

In line with previous studies, I found that Hungarian companies had very low leverage ratios. In addition, long-term debt financing was almost absent from the balance sheet of the companies.

My analysis of developments in the Hungarian financial system indicated that the macroeconomic policy of the Hungarian government, together with credit market segmentation and bank regulation, seem to be the most important components of the credit crunch in the enterprise sector. The growing public debt crowded out loans to companies. The refinancing policies of the Hungarian government led to the preferential treatment of selected companies. Those two factors, together with tight bank regulation and supervision, resulted in the credit rationing.

The regression results for the determinants of capital structure showed some sensitivity to the choice of leverage proxy but, in general, supported the results of the study by Cornelli, Portes, and Schaffer (1996).

I conclude that the negative relationship of leverage with the proportion of tangible assets was driven by the lack of long-term debt financing. The relationship of leverage with company size provides some indication of the importance of trade credits for Hungarian companies, but otherwise the relationship was neutral. The more profitable companies in my analysis had less debt than less profitable ones. This could be attributed to the firms' financial incentives, possibly aggravated by the segmentation of Hungarian credit markets and credit rationing within the financial environment. The presence of the state among the major shareholders of any company eased its access to short-term debt financing, as could be expected given the policies of the Hungarian government. The results for industrial classification indicate that manufacturing companies enjoyed substantially higher levels of debt financing. I attribute this to the policies of the nonmanufacturing group of companies, which are primarily involved in the trade business.

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