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The Capital Structure of Listed Companies in Poland

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Abstract

This paper examines the capital structure of listed firms in Poland, using firm-level panel data to study the determinants of leverage. Polish firms had extremely low leverage levels, suggesting a growing stock market and a potential reluctance of banks to grant loans to old and risky firms. The empirical exercise finds that large, new, foreign-owned firms, and firms with strong cash positions have higher levels of leverage. Finally, shareholder concentration has a neutral or even a beneficial influence on firm leverage. The nature of ownership may be primarily responsible for this finding.

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SUMMARY

There are numerous empirical studies of capital structure and its determinants in industrial countries, but few for developing countries and transition economies. This paper examines the capital structure of listed firms in Poland during the early years of the establishment of the Warsaw Stock Exchange (1991–94). The objective is to generate lessons from Poland's experience that may be useful for newly formed stock exchanges, such as those of the Baltic countries.

This paper describes Poland's financial sector in considerable detail and then examines firm-level panel data for listed firms to study the determinants of leverage, with a view to exploring how firms choose among retained earnings, debt, and shares of stock. The estimation methods include the use of descriptive statistics, correlations, and panel regression techniques, with both pooled and variance components procedures. Comparing Poland with another developing country, Indonesia, at its early stage of financial liberalization offers further insight into the behavior of financial variables across new financial systems.

In general, the paper finds extremely low leverage levels for listed firms in Poland, suggesting a growing stock market and a potential reluctance of banks to grant loans to old and risky firms. Shareholder concentration has a neutral or even a beneficial influence on firm leverage. The nature of ownership may be primarily responsible for this finding. Finally, large, new, foreign-owned firms, and firms with strong cash positions have higher levels of leverage. These results for Poland suggest certain policy implications. Authorities should promote large, new, foreign-owned firms, and those that have strong cash positions or high retained earnings in order to raise the degree of leverage. More important, efforts should be made to reduce the proportion of bad loans in banks' portfolios so that banks become willing to lend more, thereby raising the quality of leverage.

I. INTRODUCTION

This paper examines the capital structure of firms listed on the Poland's stock market and identifies lessons that may be useful for the newly formed stock exchanges of the Baltic countries.[2] Several empirical studies have examined the determinants of debt-equity ratios. Most of them, such as Titman and Wessels (1988), Zeckhauser and Pound (1990), and Rajan and Zingales (1995), focus on industrial countries and find that high leverage benefits firm performance. Others, such as Hussain (1996) and Cornelli, Portes and Schaffer (1996) look at developing countries. Hussain (1996) concentrates on Indonesia and finds that high leverage has a negative effect for a sample of listed firms. He introduces shareholder concentration as an additional variable influencing leverage. Cornelli, Portes and Schaffer (1996) examine a large sample of both listed and unlisted firms for Poland, the Czech Republic, and Hungary, asking why debt-equity ratios are generally so low in these countries. They speculate that these low levels may be detrimental to the economy. Despite these two examples, most of the well-known studies on capital structure analyze only G-7 or industrialized countries. Thus considerable scope remains for examining developing countries, especially transition economies. This paper analyzes the capital structure of listed firms in Poland. We are interested in how firms choose among retained earnings, debt, and shares of stock. Cornelli, Portes and Schaffer focus only on the choice between total debt and total equity since they also include a sample of unlisted firms.

The paper is organized in the following manner. In Section II we describe the Polish financial sector. Section III examines the empirical determinants of capital structure of listed firms in Poland and compares it with another emerging market – Indonesia in the 1980s. Finally, we conclude the paper in Section IV.

II. DESCRIPTION OF THE POLISH FINANCIAL SECTOR

In his seminar at the London School of Economics in 1990, Matthew Olex, the Polish Minister of Finance, suggested that the "long-term macroeconomic success for Poland depends crucially on the creation of a modern set of financial markets." But he also readily admitted that "we do not have a plan, a blueprint of how the financial system will look. Indeed I do not think we should have one. But we start with a reasonable understanding of what we need and of the Western experience which we can draw on."

In the spirit of this statement we can outline some of the advantages of setting up a stock market in Poland at a relatively early stage of financial development.[3] The benefits of financial

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[2] For instance, the Tallinn Stock Exchange in Estonia, which was established in May 1996.

[3] Typically, these stages are characterized first by retained earnings, then by bank debt, and finally by shares issued in the stock market.

markets include stabilizing the existing stock of savings, complementing savings in financial markets with those in the banking system, channeling equity funds from shareholders to corporations in the long-term, and enhancing the impact of monetary policy on real variables.[4] Moreover, Levine and Zervos (1996a, 1996b)[5] have found a positive link between stock market development (estimated by liquidity) and economic growth for a sample of 49 emerging market economies during 1976–93.

Clearly, Poland and other recently transformed economies are different from other developing countries in the sense that they need to privatize their state-owned sectors quickly so as not to fall behind. The use of vouchers and Initial Public Offerings (IPOs) (issued by companies going public for the first time) in privatizations calls for the simultaneous development of the primary and secondary market for shares. Often, financial intermediaries have performed this function. But the financial sector in Poland has matured to a level that a stock exchange, serving as an alternative source of finance, is warranted. Moreover, the dramatic worldwide interest in emerging stock markets during the early 1990s may have contributed to the growth of the market in Poland. In sum, the need to privatize and dilute shares combined with the globalization of stock markets provided an added impetus to the development of the stock market in Poland.

Table 1. Poland: Key Indicators

Indicators	1988	1989	1990	1991	1992	1993	1994	1995
Lending rate (average)	16.7	64.0	504.2	54.6	39.0	35.3	32.8	33.5
Refinancing rate (end-period)	6.0	140.0	55.0	40.0	38.0	35.0	33.0	29.0
Consumer prices (1990=100)	4.4	15.3	100.0	176.7	256.8	351.5	468.4	593.9
Industrial production (index)	138.1	134.1	100.0	84.0	87.3	...	...	...
GDP (m zlotys)	2,963	11,832	56,027	80,883	114,944	155,780	210,407	286,026
GDP growth (percent)		0.2	-11.6	-7.0	2.6	3.8	6.0	6.5
Foreign direct investment (m $)	15	11	89	291	678	1,715	1,875	3,659
Portfolio equity flows (m $)	...	...	...	...	...	...	...	234

Sources: IMF, 1997, *International Financial Statistics* and *World Economic Outlook*.

Since Poland is a transition economy, it differs from most Western economies that went through the usual stages of financial development–banking systems preceded the capital markets. Even though Poland's finance minister did not have a blueprint for the financial

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[4]Some of the disadvantages of financial markets include a potential for market power, intense speculation and uncertainty, lack of disclosure, and widespread fraud, especially in the early stages of institutional development.

[5]Cited in *The Economist*, July 27, 1996, p. 68.

system, it is critical to avoid serious errors at this early stage. Modifying the system later may be enormously costly. Therefore, we should apply the lessons learned from the financial systems of both Western and emerging markets to Poland–and then use the full set to inform the newly instituted financial systems, such as those of the Baltic countries.

Table 2. Poland: Equity Market

Indicator	1991	1992	1993	1994	1995
Number of listed companies	9.0	16.0	21.0	36.0	53.0
Average market capitalization (US$ Mil)	75.0	225.0	1,084.0	3,933.0	3,731.0
Average market capitalization/GDP (percent)	0.1	0.3	1.3	4.2	3.1
Average price/earnings ratio	4.1	3.4	13.3	16.4	7.8
Dividend yield at year end (percent)	0.0	5.5	0.4	0.4	2.3
Turnover ratio for companies (percent)*	18.5	49.1	194.6	128.7	67.5
Average exchange rate (zloty/US$)	1.1	1.4	1.8	2.3	2.4

* Ratio of turnover value to average market capitalization.

Source: Warsaw Stock Exchange, 1995, *Annual Statistics.*

Poland is no different from other transition economies in terms of the macroeconomic shocks to industrial output, price rises, and increases in interest rates it experienced (Tables 1 and 2). Therefore, its lessons would be valuable for other transition economies.

The Warsaw Stock Exchange was established in 1991,[6] with an initial listing of only five Polish companies and the index (WGI) was set at 1,000. Equities were issued (for the first time since 1939) with the aim of privatizing about 2,500 enterprises.[7] But by the end of 1995 almost 4,200 enterprises were privatized (half the total number of state-owned enterprises). The privatization process, as part of the 1990 Act on Enterprise Privatization, was to be implemented using one of the following methods: capital buyout, enterprise

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[6]There was also a parallel market that comprised 12 companies with total market capitalization of US$150 million, as of the end of 1995.

[7]Gomulka (p. 64) in Prindl (1992) discusses the concept of the *privatization multiplier* which is essentially the influence of private capital on the economic decisions of the entire economy. The author suggests that banks should be privatized in the second stage and should be largely state-owned in the transition stage. The size of the multiplier would depend on the quality of the financial sector and its allocative and coordination functions and would contribute to a higher level of equilibrium for the real sector. In a related paper, Husain (1994) shows a fall in total industry output in the short run because of the closure of state-owned firms, but an increase in the number of private firms and a consequent rise in total output in the long run for transforming economies.

liquidation, bankruptcy, or commercialization. The relevant method for this paper is capital buyout, which 100 enterprises opted for, 22 of which began to be traded on the Warsaw Stock Exchange.

Under this method enterprises were purchased by the public in the primary stock market or were bought by strategic investors at closed-end auctions. In all cases employees were permitted to purchase up to 20 percent of total shares, and the state continued to hold more than 20 percent of the stake in every company (see Bolt and Milobedzki 1994). The stock market was to provide the main channel for the allocation of shares. Consequently, the stock market grew to become the most liquid market in Central Europe (in terms of turnover, with almost 0.5 million investors), and by 1993 the Warsaw Stock Exchange was one of the fastest growing stock markets in the world, rising more than 1000 percent in US dollar terms during that year. However afterwards, it also turned out to be highly volatile and less liquid (note the fluctuations in the turnover ratio in Table 2), being driven primarily by speculators, though the rules were explicitly formulated to prevent excessive volatility and to maximize the number of shares traded. The settlements were guaranteed by the Warsaw Stock Exchange Guarantee Fund, and trades were made three days a week. The profits earned on the Warsaw Stock Exchange were tax-exempt, but this benefit was expected to be phased out in the future.[8]

Substantial changes were also made in the banking sector. By 1992 the authorities had issued licenses for the establishment of about 80 new banks.[9] About five had joint foreign ownership and an additional two were wholly foreign-owned. Fourteen had representative offices.The formation of banks as joint stock companies was designed to provide local informational advantages for both bank loans and shares of equity. [10]

As part of the reforms the central bank was made independent in 1989 with the introduction of a two-tier banking system and auctioning of National Bank of Poland bills. Internal convertibility of the zloty was introduced for import transactions, and a system of banking supervision was established. The National Bank of Poland continued to resort to deficit financing. Prices and trade were liberalized and the zloty was devalued. The fixed exchange

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[8]See Lorinc (1995) and Bolt and Milobedzki (1994) for more details on the structure and regulations of the Warsaw Stock Exchange. Also see Warsaw Stock Exchange (1995).

[9]It appears that there were too many banks given the population of only 40 million and a low level of savings and investment at the early stages of transition.

[10]It is sometimes suggested that during the transition stage, when the restrictions on capital flows have not been completely lifted and financial markets are not fully developed, it may be beneficial for authorities to initially grant permission mainly to domestic banks, which enjoy a local informational advantage as compared to foreign banks. Otherwise, there is a danger of large capital flight at a very early stage. Clearly, this suggestion is open for debate and empirical enquiry.

rate system held between January 1990 and October 1991, after which a crawling peg system was reinstated with the zloty pegged to a basket of currencies. Poland had instituted a heterodox stabilization program, combining an exchange rate-based stabilization program with income policies (wage and price controls). Finally, though the current account became convertible in 1989, tight controls on capital flows still remained in place.

Poland's financial reform plan was to transform state-owned banks into joint stock companies. The transformation was to be effective only after banks met the 8 percent capital adequacy requirement. Banks' reputations were not fully developed at this transition stage, since the privatization issue was being resolved through the stock market. But banks could trade shares through their desks. Poland has a relatively well-developed interbank market and an advanced money market. The domestic corporate bond market has attracted little attention compared with the stock market. This can be partly attributed to credit risk, market risk, and other legal restrictions. Foreigners have shown minimal interest in the bond market. Moreover, the secondary bond market has been primarily restricted to foreign investors. Though the corporate bond market is very small, the state treasury bonds are widely traded on the Warsaw Stock Exchange. To recapitulate, the Polish financial system has developed remarkably well and in many ways resembles that of most developing middle-income countries.

III. CAPITAL STRUCTURE: EMPIRICAL FINDINGS

In this section we identify the most interesting features of the capital structure of Polish listed companies and its relationship to ownership structure, dividend policy, asset characteristics, firm size, profitability, age, taxes, and cash positions during the 1990s. At the same time we also try to determine whether the firms had majority domestic or foreign ownership. Though this is a detailed study of only one market, additional insight can be gained if we compare conditions in Poland with those of another emerging market at the time of its establishment. We have chosen Indonesia in the 1980s, which was analyzed extensively in Hussain (1996). Here, our aim is to simply compare the results we obtained for Poland with the results for Indonesia. We must note an obvious advantage enjoyed by the Polish financial market at the time of its formation relative to the Indonesian market–it benefited from the rapid globalization of capital flows.

Researchers studying transition economies often compare the financial structures of transition economies with those of industrial economies (for example, Cornelli, Portes and Schaffer 1996). But we can gain greater insight by comparing the financial sectors of transition economies with those of other emerging-market economies (such as Indonesia), because the initial conditions in developed financial markets were dramatically different when they were established. Most emerging markets have set up their stock markets in the last two decades. During the 1980s, Indonesia had a "thin" equity market, listing only 24 companies with a market capitalization of only US$250 million. Moreover, its debt-to-equity ratios were phenomenally high, in part because of a high degree of ownership concentration. In sum,

Indonesia in the 1980s enjoyed a well-developed banking sector relative to Poland's in the 1990s, even though the stock markets in both countries were equally (un)developed.

A. Descriptive Statistics

The variables used in the study for Poland are defined as follows:

AGE	1994-EST
COMPDUM	Company Ownership Dummy by Dominant Shareholder (Domestic Shareholder=1, Foreign Shareholder=0)
EST	Date Established
INTA	Intangible Assets
PIC	Paid-up Capital
PRA	Profit after Tax
PRB	Profit before Tax
RAT1	Total Liabilities/Total Assets
RAT2	Total Liabilities/Total Equity
RAT3	Total Liabilities/Paid-up Capital
RE	Retained Earnings
RETASS	RE/TOTA
RETEQ	RE/SF
RETPUP	RE/PIC
SF	Shareholders' Fund (Equity)
SUMSH	Sum of 4 Largest Shareholders
TA	Tangible Assets
TAX	PRB-PRA
TOTA	Total Assets

Our original sample consisted primarily of accounting data for 27 listed companies obtained from the FT Extel database for the period 1991–94.[11] Of these 27 companies listed on the Warsaw Stock Exchange , 4 were banks and 6 had missing data. Since the balance sheets of banks have a strikingly different structure than those of nonfinancial companies, we excluded banks from our sample. Therefore, even though the resulting number of firms appears to be small, the total market capitalization of the 17 firms remaining in our sample relative to that of the whole stock exchange is still almost 83.3 percent (US$2.49 billion/US$3.00 billion) as of 1993. This is a reasonable and a sizable sample representation of the overall stock market.

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[11]This database contains accounting and financial information on about 25,000 companies spanning a large set of countries. Most of the information comes from annual reports of listed companies.

The most noteworthy observation is the presence of very low ratios of liabilities to assets (RAT1)–an average of 32.2 percent for 1993 (Table 3)–for listed firms in Poland.[12] This figure contrasts with the debt-asset ratio of 41.0 percent in Poland for a large sample of listed and unlisted firms (41,000 companies as of end-1992) (Cornelli, Porter and Schaffer 1996), 66.0 percent for G7 countries (Rajan and Zingales 1995), and 392.0 percent for Indonesia (Table 4). Moreover, the ratio of liabilities to equity (RAT2) and of liabilities to paid-up capital (RAT3) in Poland are 68.4 percent and 231.9 percent, respectively.

As Cornelli, Porter and Schaffer (1996) note, we should expect these ratios to be higher for transition economies than for industrial economies because of the presence of tax shields and lower costs of bankruptcy. Bankruptcy costs are lower because courts are not well-developed making it difficult to recover bad debt. Tax shields in these countries are prevalent because of high taxes on firm profits. Both factors ought to increase firms' reliance on debt from the demand side. A natural question is: what explains the prevalence of very low debt to asset (or even debt to equity) ratios in Poland? Disentangling the potential reasons could be difficult because of the identification problem. One possible answer is the reluctance of banks to offer large loans to firms that have not yet developed a reputation. A second explanation is that some firms have accumulated bad loans in their portfolio from the communist years functioning under soft budget constraints. Some unwillingness on the part of banks could be a result of high inflation, since we observe low levels of not only nominal rates, but also real lending rates. Some authors, such as Dittus (1994), argue that because of high budget deficits that contributed to attractive rates on treasury bills, banks may have lent more to the government at the expense of firms. These reasons pertain to the supply side.

Finally, it is also likely that large, reputable firms relied heavily on retained earnings or shares of stock for their financing (since the denominator could be high). This demand-side phenomenon could have led to rapid growth of the Warsaw Stock Exchange in its early years. However, the supply-side effects appear more plausible.

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[12]Ideally, debt would have been a better variable to use. But we were missing a large number of observations, we instead selected company balance sheet liabilities as a reasonable proxy for debt.

Table 3. Poland: Leverage Ratios

| Ratios	Mean	Standard Deviation	Minimum	Maximum
1991				
Liabilities/assets	0.3230	0.1391	0.1643	0.6635
Liabilities/equity	0.8059	0.8779	0.1980	2.8184
Liabilities/paid-up capital	3.9124	7.5632	0.3983	32.1077
1992				
Liabilities/assets	0.3125	0.1441	0.0890	0.6198
Liabilities/equity	0.7458	0.7583	0.0986	3.0056
Liabilities/paid-up capital	5.0000	11.928	0.3106	54.4420
1993				
Liabilities/assets	0.3220	0.1440	0.1155	0.5752
Liabilities/equity	0.6835	0.5069	0.1307	1.8705
Liabilities/paid-up capital	2.3088	3.0081	0.3427	13.3220
1994				
Liabilities/assets	0.2745	0.1509	0.0756	0.5561
Liabilities/equity	0.5735	0.4842	0.0870	1.5865
Liabilities/paid-up capital	1.4287	1.3653	0.1874	5.2802

Figure 1. Poland: Leverage Ratios
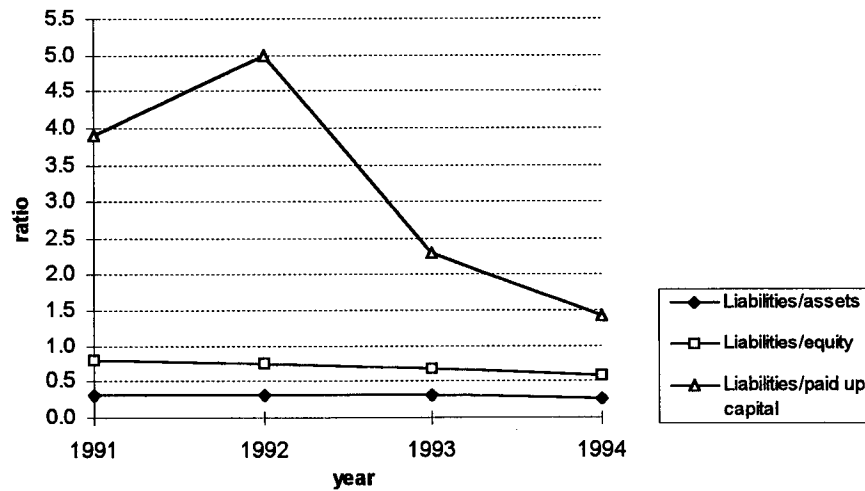
Table 4. Indonesia: Average Debt Equity Ratios

	1988	1989	1990
Domestic firms	6.13	1.09	1.12
Foreign firms	1.59	0.89	1.04
All firms	3.92	0.99	1.08

Source: Hussain (1996).

A second feature of the Polish listed companies were the relatively small dividend yields during the exchanges's first five years (Table 5). When we compare these yields with those in Indonesia (Table 6), we notice that dividend yields in Indonesia were far higher than those in Poland. The nature of large shareholders in the two countries may be responsible for this marked variation. In particular, the large family groups in Indonesia may be attracting substantial dividends to themselves. It is commonly accepted that high dividend yields raise the cost of capital. In addition, the price-earnings ratios in Indonesia remained low and somewhat stable, especially during 1984–87 (Table 6). In Poland they jumped sharply during 1993 and 1994, signifying an improved expected performance (Table 5). Typically, price-earnings ratios measure firm performance – high ratios indicate either lower costs of capital or higher expected growth. Contrasting figures for both dividends and price-earnings provide additional support for the fact that the Warsaw Stock Exchange grew at a faster pace than the more dormant Jakarta Stock Exchange during its early phase.

Table 5. Dividend Yields and Price-Earnings Ratios at the Warsaw Stock Exchange

Year	Market dividend yield	Price-earnings ratio
1991	0.0	4.1
1992	5.5	3.4
1993	0.4	13.3
1994	0.4	16.4
1995	2.3	7.8

Source: Warsaw Stock Exchange (1995).

Table 6. Dividend Yields and Price-Earnings Ratios at the Jakarta Stock Exchange

Year	Market dividend yield	Price-earnings ratio
1980	12.07	1.10
1981	13.08	0.89
1982	12.10	6.48
1983	17.39	4.98
1984	16.07	3.85
1985	15.26	3.50
1986	17.66	3.58
1987	13.90	3.46

Source: Hussain (1996).

A third feature of the Warsaw Stock Exchange was the low ownership concentration of firms. Interestingly, the concentration ratio (as measured by the sum of the four dominant shareholders) averaged 41.7 percent in 1994. This ratio is far smaller than that of Indonesia, which was 63.4 percent in 1990. Presumably, the ratio was far higher for Indonesia when the Jakarta Stock Exchange was established in 1977. Moreover, the Jakarta Stock Exchange was dominated by large families.

In this study, the largest shareholders in the Warsaw Stock Exchange have been separated into several groups:[13] State, Banks (domestic), Foreign, Investment Companies, and Domestic Companies. Some overlap among these categories is inevitable. We find that six of the largest shareholders were the State, four were Banks, twelve were Foreign, eight were Domestic Companies, and four were Investment Companies. If we examine only the single dominant shareholders for each firm, we find that four were State, two were Banks, five were Foreign, seven were Domestic Companies, and there were no Investment Companies. Investment Companies were, however, more common as second and third largest shareholders. During the period under study there were very few small individual investors. The stock market was dominated by substantial stakeholders, such as the State, which was reluctant to dilute its shares, and by large mutual funds (Investment Companies).

The nature of the companies that are listed sheds additional light on the expected development of the Warsaw Stock Exchange. In 1995 the largest category was banking stocks, which constituted 36.4 percent of the total share of stocks, in terms of market capitalization, followed by Food (17.1 percent) and Trading (16.9 percent). It is interesting to note that total Manufacturing (other than Food) made up only 20.7 percent of all listed shares. It is believed that trading in Banking stocks is generally light (possibly because of the higher concentration of ownership), but that in Manufacturing stocks is relatively strong. If this presumption is true, the stock market would be expected to develop at a slower pace, resulting in a rather inactive market. Therefore, a policy objective should be to give Manufacturing companies incentives to increase their share of market capitalization.

Table 7. Poland: Structure of Ownership

Largest Shareholdings (%)	Mean	Standard Deviation	Range
1994	41.71	14.36	24.0–70.5

[13] Note that the shareholder data were available only for the latest sample (1994) and are assumed to be the same for earlier years.

Table 8. Indonesia: Structure of Ownership

Firms	Largest Shareholdings (%) 1990			Public Ownership (%) 1990		
	Domestic	Foreign	All	Domestic	Foreign	All
Mean	62.2	65.6	63.4	24.8	25.2	24.9
Range	16.1–89.3	19.2–85.0	16.1–89.3	10.0–52.2	2.3–59.2	2.3–59.2

Source: Hussain (1996).

B . Correlations and Regressions

Correlations

The correlations present a partial picture of relationships between variables; the regressions shed additional light on the "causal" relationships. Correlation coefficients were estimated for the three types of ratios: RAT1 (liabilities/assets), RAT2 (liabilities/equity), and RAT3 (liabilities/paid-up capital) and the variables include AGE, RE, TOTA, PRB, PRA, TA, INTA , and SUMSH (Table 9).

Regressions

To run our regression analysis, we first pooled (using the POOLED procedure) all the nonmissing observations in the sample. Let us assume our data set consists of i=1,...,N firms and t=1,...,T years.

The equation can be written as:

$$y_{it} = X_{it}\beta + \alpha + \epsilon_{it}$$

where α is an intercept and ϵ_{it} is independently and identically distributed. In addition, the coefficient estimates are common for the whole sample.

We can also write down an error-components model (VARCOMP) as:[14]

$$y_{it} = X_{it}\beta + \alpha + \epsilon_{it} \text{ and }_{it} = u_i + v_i + w_{it}$$

where $u_i \sim N(0,\sigma_u^2)$ is the cross-section error component, $v_i \sim N(0,\sigma_v^2)$ is the time-section error component, $w_i \sim N(0,\sigma_w^2)$ is the combined error component.

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[14] See Pindyck and Rubinfeld (1991, 226–27).

In this model, we assume that each error component is not autocorrrelated and is uncorrelated with the other components.

The general regression equation is as follows:

$$DE = \alpha + \beta_1 AGE + \beta_2 RET + \beta_3 TOTA + \beta_4 PRA + \beta_5 TAX + \beta_6 SUMSH + \beta_7 COMPDUM + \epsilon$$

where DE can be RAT1, or RAT2, or RAT3 and
RET can be RETASS, or RETEQ, or RETPUP.

Before we discuss the regression results, we briefly outline the method. Even though other panel procedures are available, such as regressing averages of each cross-sectional unit and fixed effects, we report the POOLED and VARCOMP results only (Tables 10 and 11). Moreover, in general, the results differ only slightly among the respective procedures, and fixed effects does not work with dummy variables. The results of POOLED and VARCOMP also differ slightly. In both Tables 10 and 11 we have reported six regression equations—the first three in logs and the following three in levels. The log regressions have a prefix L and the level regressions have no prefix.

One limitation is that the number of observations is small, especially for log regressions, even though the total possible sample size is 92. Panel procedures are programmed to drop the complete row even if only one of the variables used in the regressions has missing observations. But the number of observations is larger in the regressions with levels. Another problem is the likelihood of simultaneous equations bias, but instrumental variables are difficult to obtain in accounting data. Finally, the ratio of bank loans to equity is not included because of lack of observations for bank loans.

Discussion of Results

The first variable included is age of the company (AGE), which is simply the latest year for which we have data minus the year of establishment. Ideally, the year the firm listed in the stock market or was privatized should be used, but given the fact that the stock market was recently set up, these variables would provide little additional insight. One word of caution here is that we have not explicitly accounted for the long period of communist rule, when all firms were owned by State, in our empirical results. Nevertheless, the use of the year of establishment can be rationalized on the grounds that older firms have accumulated knowledge, reputation, and other intangibles that are valuable in influencing choices of financing.

Our results indicate that the coefficient estimates are very significant[15] with a negative sign in all six regressions. This indicates that old firms are enjoying smaller leverage ratios. There are two possible explanations for this result. First, like in many stock markets, older firms in Poland may have attained stronger reputations and can expect to rely heavily on equity in general, even on paid-up capital, and less on liabilities for their funds. Second, banks are reluctant to grant loans to old firms already wrought with bad loans (given under the communist regime as part of soft budget constraints). Newer firms, however, are apparently relying more on debt than on shares of stock or retained earnings. The first explanation appears to be less persuasive since reputation takes time to develop in the stock market. The second explanation–that there was a glut of unregulated banks with an excessive volume of bad loans in the 1980s, and banks were therefore unwilling to issue new debt–appears more plausible.

The ratios of retained earnings to assets, equity, and paid-up capital, (RET) indicate a strong positive relationship with debt-equity. The significance of parameters is even stronger for the regressions in levels. Firms with high retained earnings or cash positions are relying more on external liabilities than on external equity. The evidence is in line with the arguments brought forth by Bernanke and Gertler (1987), who suggest that companies with strong balance sheets will enjoy lower costs of external financing, which will stimulate investment. This observation is true in our Polish sample only for external debt, but not for external equity. In other words, a "complementary effect" between retained earnings and liabilities, and a "substitution effect" between retained earnings and paid-up capital seem to hold. Further, the correlation result between retained earnings (RE) and the ratios are generally positive in 1991–93, but then turn negative in 1994. This change may indicate that firms with high retained earnings eventually can turn to the equity market rather than the debt market.

As expected, large firms are highly leveraged (see Titman and Wessels 1988), as shown by the positive, significant coefficient estimates of TOTA. Large firms are able to reduce the risk of bankruptcy since they are typically more diversified and thus can easily obtain more debt.

Our results for current profitability (PRA – Profits after taxes) show that profitable firms almost always rely more on equity. The estimates become even more significant in the level regressions. But, it is not clear from the regressions whether the profitable firms rely more on internal funds or issue shares of stock for their funding. This is because the coefficient estimate of log PRA in the regression with LRAT3 is insignificant and positive. Some of

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[15] In the regression results reported in this paper, whenever we refer to the coefficient estimate as being significant, the t-statistic is close to or greater than an absolute value of 2. When a variable is insignificant, the t-statistic is between 0 and 1 in absolute terms.

the regression results do not support the well-known "pecking-order"[16] and the "static-tradeoff"[17] theories of financial development that suggest the most profitable firms will rely on debt financing. On the other hand, the correlations between the proxies for profits (PRA and PRB) and leverage have strong, positive coefficients. This is consistent with the "pecking order" argument that the most profitable firms rely on debt for their funding. Moreover, the fact that RAT3 is even more positive than RAT2 suggests that firm profitability is directly associated with retained earnings and inversely related to the stock market. Therefore, overall, the results for profitability are mixed.

As far as the role of taxes is concerned, we do not have a good proxy to estimate the influence of double taxation on equity. But, we have used the amount of corporate taxes for each firm (TAX). This variable is simply the difference between profits before and after taxes. The parameter estimates for this variable are not highly significant, but do have negative signs in most cases. Thus there is weak evidence of relationship between taxes and debt-equity ratios.

Most important, the degree of ownership concentration, as measured by SUMSH (the sum of shares of the four largest shareholders for every firm), typically shows a negative but insignificant relationship with RAT1, RAT2, and RAT3. We would generally expect a strong positive relationship at the early stage of financial development for an emerging market such as Poland. Large shareholders are expected to adversely affect leverage and the cost of capital when financial markets are underdeveloped (see Hussain 1996) because these shareholders attract high dividends to themselves, are unwilling to dilute shares, and weaken the incentives for firms to issue new equity. However, some researchers find that concentration has a neutral effect on leverage for developed financial markets (see Zeckhauser and Pound 1990 for the U.S. case). Alternatively, Hussain (1996) obtains an unambiguously positive relationship for Indonesia.

The ownership structure at the Warsaw Stock Exchange appears to be dramatically different than at the Jakarta Stock Exchange. The Jakarta Stock Exchange was characterized by traditionally dominant family groups who were reluctant to dilute their shares for an extended time period. They thereby increased their reliance on bank debt. These shareholders were behaving as monopsonists in the market for equity. The shareholders at the Warsaw Stock Exchange include banks, investment companies, and the state. These shareholders do not have an adverse impact on firms' capital structure. In fact, they appear to have a neutral or even a somewhat beneficial effect, given the insignificant results. Moreover, the fact that banks are permitted to hold equity may be improving the

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[16] According to this theory firms prefer financing investment first through retained earnings, then debt, and finally through the issuance of equity.

[17] This approach suggests that firms choose a level of debt by estimating the benefits and costs of incurring additional debt. See, for example, Jensen and Meckling (1976).

quality of firm monitoring through duplication of monitoring and economies of scale in monitoring. Better monitoring must be improving the reputation of listed firms at a rapid pace. In addition, as noted earlier, the average debt-to-equity ratios and concentration ratios are far lower than those in Indonesia. Given that the bond market in Poland is relatively small, banks may have been reluctant to grant large loans to firms whose reputation had not been established. This can be considered the supply side phenomenon.

The correlations, however, do show significant positive signs in later years. Apparently, dominant equity owners may realize their monopsonistic role once the privatization process passes its initial phase.

In short, the nature of ownership and capital structure of listed companies in Poland differs greatly from that in Indonesia during the early stages of its stock market. It appears that the lack of established family shareholdings, the need for rapid privatization, and the globalization of stock markets have benefited the Polish stock market. This is because large family shareholdings were responsible for the slower development of the Indonesian stock market. Unlike the Indonesian market, the Polish stock market has grown at a remarkable pace, becoming the most liquid market (with 0.5 million investors) in Central Europe and the fastest growing stock market in the world in 1993, rising more than 1,000 percent in US dollar terms during that year alone.

We also used a dummy variable (COMPDUM) to estimate the relationship between the nature of ownership for the largest shareholder (domestic=1, foreign=0) and capital structure of listed firms. We find a very strong negative relationship in all cases, suggesting that domestically owned firms unambiguously on average enjoy lower debt-equity ratios than do foreign-owned firms. It is possible, that the foreign-owned firms are relying more on debt than are domestically owned firms. One policy implication of this result for Poland is that if the main aim is to raise the degree and quality of leverage, then authorities ought to encourage foreign ownership of firms.

Finally, we only tried the correlations (and not regressions) for tangible (TA) and intangible (INTA) assets with leverage because of a small number of observations. Since tangible assets act as collateral, we would expect a positive relationship with leverage. On the other hand, intangible assets raise the possibility of moral hazard; hence banks would be reluctant to lend to firms that spend considerably on research and development, and advertising (see Zeckhauser and Pound 1990 and Shnure 1992). Alternatively, it is equally possible that intangible assets increase expectations of future value, and banks would thus be willing to lend. In that case, a positive relationship would hold with leverage (see Hussain 1996).

Tangible assets are generally negatively correlated (except for 1994, RAT2 and RAT3; and for 1993, RAT3) indicating that firms enjoying high-valued tangible assets have high retained earnings or share value. Separate correlations with current assets (not reported below) show strong positive coefficients, signifying that current assets may be more important than tangible assets as a determinant of banks' willingness to lend. This, in turn,

may suggest that banks are considerably risk-averse and care greatly about liquidity, especially when firms' reputations are not clearly established. Moreover, tangible assets such as buildings and land would be harder to convert to liquid assets in transition economies such as Poland, where markets are less developed and the legal framework is rudimentary.

When we examine intangible assets, we find ambiguous coefficients and signs. The negative correlations in the earlier years become positive in the last two years (1993, 1994), meaning that during these last two years firms have relatively easier access to debt (including bank loans). It is likely that the reputation of firms (with a high proportion of intangible assets) has been established somewhat over time and banks and other lenders are willing and easily able to grant loans to these firms.

Table 9. Poland: Sample Correlations
(1991–94)

Variable	RAT1 1991	RAT2 1991	RAT3 1991	RAT1 1992	RAT2 1992	RAT3 1992	RAT1 1993	RAT2 1993	RAT3 1993	RAT1 1994	RAT2 1994	RAT3 1994
AGE	-.2023	-.2650	-.1921	-.2267	-.2318	-.1425	-.2865	-.3759	-.4511	-.5883	-.5534	-.3472
RE	-.0329	.2341	.4765	-.0379	.5263	.8516	-.0612	.2367	.2318	-.3528	-.3543	-.3146
TOTA	.0646	.6417	.9492	.0707	.7040	.9774	-.0854	.2960	.2788	.1341	.4835	.3368
PRB	-.1950	.3150	.7169	-.1037	.5480	.9198	-.2171	.1614	.1794	.0845	.4269	.3956
PRA	-.2604	.0188	.3134	-.2603	.2965	.6846	-.2954	.0348	.1225	.0071	.3399	.3561
TA	-.1272	-.3281	-.2743	-.2527	-.3267	-.2006	-.0313	-.0665	.0013	-.0769	.1904	.2509
INTA	.0710	-.0536	-.1647	.0324	-.0882	-.1449	.1342	.0095	.0382	.0383	.3092	.1328
SUMSH	.0489	-.1274	-.0972	.0399	.0729	-.1508	.2434	.4657	.2309	.5980	.6408	.6776

Table 10. Poland: Pooled Regression Results
(1991–94)

Variables	LRAT1	LRAT2	LRAT3	RAT1	RAT2	RAT3
Number of Observations	29	31	29	46	46	44
C	-.1250 (-.1287)	.4447 (.3551)	2.615 (1.280)	.4585 (4.686)	.8272 (1.758)	3.154 (2.013)
AGE	-.2935 (-5.002)	-.6496 (-5.143)	-.6520 (-5.629)	-.0009 (-1.493)	-.0026 (-.8893)	-.0211 (-2.099)
RET	.0124 (.2676)	.0686 (1.229)	.1936 (2.493)	.1959 (.7117)	1.581 (2.473)	1.911 (5.007)
TOTA	.2035 (1.812)	.6315 (3.069)	.1630 (.7313)	.0000002 (3.843)	.0000008 (5.042)	.000002 (3.464)
PRA	-.1127 (-1.123)	-.2660 (-2.231)	.0974 (.4790)	-.000002 (-2.712)	-.000008 (-3.253)	-.00002 (-2.492)
TAX	-.0375 (-.4116)	-.0487 (-.4609)	-.2144 (-1.220)	.0000001 (.1444)	-.0000008 (-.2332)	.000007 (.5479)
SUMSH	-.1637 (-1.062)	-.2877 (-1.427)	.0978 (.3359)	-.0007 (-.4839)	-.0006 (-.0992)	-.0001 (-.0049)
COMPDUM	-.5797 (-5.565)	-.9370 (-7.034)	-1.130 (-5.048)	-.1382 (-3.011)	-.4048 (-1.885)	-1.585 (-2.062)
R^2	0.7558	0.8661	0.8257	0.4208	0.5314	0.7140

Note: t-statistics are reported in parenthesis.

Table 11. Poland: Variance Components Regression Results
(1991–94)

Variables Number of Observations	LRAT1 29	LRAT2 31	LRAT3 29	RAT1 46	RAT2 46	RAT3 44
C	-.1762 (-.1714)	.8578 (.6941)	2.965 (1.560)	.4646 (4.470)	.8319 (1.619)	4.414 (2.444)
AGE	-.2914 (-4.614)	-.5914 (-7.441)	-.6582 (-5.578)	-.0009 (-1.486)	-.0030 (-.9443)	-.0287 (-2.498)
RET	.0103 (.2329)	.0442 (1.111)	.1989 (3.815)	.1512 (.5541)	1.525 (2.427)	1.467 (3.772)
TOTA	.2009 (1.801)	.4083 (3.863)	.1586 (.9231)	.0000001 (3.336)	.0000007 (4.174)	.000001 (2.029)
PRA	-.0996 (-1.048)	-.1779 (-2.109)	.0772 (.5694)	-.000002 (-2.721)	-.000008 (-3.129)	-.00002 (-2.169)
TAX	-.0421 (-.4894)	-.0740 (-1.095)	-.2021 (-1.752)	.0000001 (.1482)	-.0000007 (-.2285)	.000007 (.6182)
SUMSH	-.1703 (-1.056)	-.3209 (-1.668)	.0504 (.1809)	-.0005 (-.3125)	.0021 (.2961)	.0048 (.1962)
COMPDUM	-.5701 (-5.146)	-.9359 (-6.798)	-1.102 (-5.263)	-.1384 (-2.721)	-.4161 (-1.649)	-2.261 (-2.374)
R^2	.8026	.9103	.8740	.4543	.5990	.7806

Note: t-statistics are reported in parenthesis.

IV. CONCLUSIONS

In this paper we have conducted a detailed study of capital structure in Poland. We can draw certain lessons from Poland's experience and apply them to the Baltic countries, which have only recently begun to reform their economies and establish their financial sectors.

First, the Warsaw Stock Exchange possessed more positive characteristics–such as lower dividend yields and higher price-earnings ratios–at the time of its establishment than did exchanges of some emerging markets (like Indonesia) when they were formed. The first important finding for Poland is the presence of dramatically low debt-asset ratios compared to Indonesia (32.2 percent versus 392.0 percent). Whereas Cornelli, Porter and Schaffer (1996) suggest that such low ratios have negative implications, perhaps these low ratios are not all that bad. Rather, these ratios point to a growing stock market and an obvious reluctance of banks to grant loans to old and risky firms that have accumulated bad loans during the communist era. Our empirical results indicate that both larger firms and newer firms enjoy higher levels of leverage. These firms may enjoy better reputations with banks.

Second, the role of shareholder concentration is either neutral or even beneficial in Poland. Unlike other markets where family holdings are widely prevalent, in Poland we find that only banks, investment companies, and the state are dominant shareholders. Moreover, banks are also allowed to hold equity in firms. This facilitates economies of scale and duplication in monitoring, which is particularly crucial in the earlier stages of financial development, when firms' reputations are not clearly established (see Hussain (1997) forthcoming).

Third, domestically owned firms generally have lower debt-equity ratios than foreign-owned firms, signifying that domestic firms rely more on the stock market for their funds. Fourth, banking stocks constitute the largest share (36.4 percent) of all listed stocks on the Warsaw Stock Exchange, with manufacturing stocks accounting for only 20.7 percent of listed stocks. Since trading in banking stocks is generally observed to be light, ownership of other industry categories should be encouraged. Finally, the listing of larger firms with high retained earnings should be encouraged if the aim is to raise the level of leverage.

What policy implications can we derive from these results ? Authorities should promote firms that are large, new, and foreign-owned, and firms with strong cash positions or high retained earnings in order to raise the degree of leverage. More importantly, efforts should be made to reduce the proportion of bad loans in banks' portfolio so that banks become willing to lend more, thereby raising the quality of leverage.

Limitations of the study include a relatively small sample size, lack of adequate and detailed data on debt, and simultaneity problems in the accounting data. Further, the comparison of Poland and Indonesia should be treated with some caution since the two countries' stock markets were established a decade apart. In particular, the Warsaw Stock Exchange was founded when the globalization of capital markets was at its peak–during the early 1990s.

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