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THE CAPITAL STRUCTURE OF LISTED INDUSTRIAL COMPANIES IN JORDAN

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Key Words

Amman Bourse; Capital Structure; Leverage Rations; Debt Maturity; Structure; Long Term Debt.

Abstract

This paper examines the capital structure of listed industrial companies in Jordan. Using firm - level panel data, the mean leverage ratios and the mean ratios of long term debt to total debt are calculated during the time period 1978 - 1998. Based on the statistical analysis, it is found that company size and retained earnings divided by total assets are significant determinants of leverage. Furthermore, it is found that fixed assets to total assets and total assets are the only significant determinant factors of the debt ratios.

Introduction

Firm financing patterns have attracted a large number of theoretical and empirical papers. One strand of this literature examines the financial structure of companies across and within countries and looks for underlying explanatory variables.

Using firm - level panel data, the purpose of this paper is to examine the determinants of the capital structure (leverage) and the debt maturity structure of these companies.

The paper is organized as follows. Section II provides some basic information about the industrial listed companies and the total market to indicate the relative size of the industrial sector in AB. Section III reviews the empirical literature which examines the determinants of the capital structure and debt maturity structure of companies. Section IV presents the data and methodology and Section V presents and discusses the empirical results. Finally, Section VI concludes the paper.

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Table 3
The Trading Volume in Amman Bourse

Year	Trading Volume of Each Sector Relative to Total Trading Volume (%)			
	Industrial	**Banking**	**Services**	**Insurance**
1978	51	34	11	4
1980	42	42	14	2
1982	35	44	13	8
1984	28	62	5	5
1986	28	60	5	7
1988	60	32	6	2
1990	59	27	12	2
1992	60	23	14	3
1994	38	43	16	3
1996	39	39	20	2
1998	47	46	6	1
Mean	44	41	11	4

Source: Various Amman Bourse Annual Reports

These observations are due to the fact that the industrial sector's share price index reflected some serious decrease during the period (1994-1998). This can be seen in Table (4).

To sum up, we can state that the industrial sector constitutes a large part of the whole market. The number of listed industrial companies is about (50%) of the total number of listed companies. Similarly, the industrial sector makes up about (41%) and (44%) of the whole market in terms of its market capitalization and trading volume respectively.

Table 4
Stock Market Returns (Indices)
(Percentages)

Year	Industrial	Banking	Services	Insurance
1980	+46	+54	+3	+21
1982	+24	+110	+65	+159
1984	-36	-39	-47	-43
1986	-3	-3	-26	+9
1988	+24	0	+19	+26
1990	+25	-6	7	-35
1992	+99	+25	+101	+87
1994	-12	+37	-19	-4
1996	-9	+23	-12	-13
1998	-34	+45	-5	+3

Source: Various Amman Bourse Annual Reports

Financial Structures: A Literature Review

It is well known that in perfect financial markets, the value of a company is independent of its financing choice (Modigliani and Miller, 1958). Following this "traditional" work, the analysis of financing patterns has been extended to incorporate taxes, bankruptcy costs and more recently, agency costs.

In addition, the financial structure of companies has proven relevant in a number of other research areas. We can classify this research work under three parts. First, a number of researchers investigated the determinants of the financing patterns (debt to equity ratios) of companies within and across countries[1]. Second, some researchers examined the impact of different com-

(1) See, for example, Harris and Raviv (1991), Demirguc - Kunt and Maksimovic (1996), Rajan and Zingales (1998).

pany financing patterns on economic growth[2]. Third, a number of researchers examined the maturity structure of debt, its determinants and impact on the performance of companies within and across countries[3].

Relative to the subject matter of this paper, if we look at Table (5), we can see that the "degree of riskiness inherent in the liability structure of East Asian corporates is evident in the data... Leverage, defined as total debt over equity, remained also high for many East Asian Countries, much above that in other developing countries and many developed countries" (Claessens, 1998:8).

Regarding the capital structure within countries, Hussein and Nivorozhkin (1997) used firm - level data to study the determinants of leverage in Poland. They used a number of explanatory variables and based on a sample of 17 companies and the time period 1991-1994, their results indicated that both larger firms and newer firms enjoy high levels of leverage.

Table 5
Leverage for Five Asian Countries, Germany and the US
(% Means)

Country	1990	1994	1996	1988-1996
Hong Kong	1.783	2.273	1.559	1.902
Japan	2.871	2.193	2.374	2.302
Korea	3.105	3.530	3.545	3.467
Singapore	0.939	0.862	1.049	0.936
Thailand	2.159	2.126	2.361	2.008
US	0.904	1.066	1.125	1.034
Germany	1.582	1.512	1.472	1.514

Source: Adapted from Claessens et al., 1998, p.9

(2) See, for example, Levine and Zervos (1998), Stutz (1999).

(3) See, for example, Schiantarelli and Sembenelli (1996), Schiantarelli and Srivastava (1996).

Relative to the maturity structure of debt or the optimal mix of long and short term debt within countries, many explanatory variables have been considered. These include "firm's credit rating, its portfolio of growth opportunities, the profitability of the project, the ability to fund the project through retained earnings, the liquidation value of the assets, the perceived accuracy of financial information, the firm's size and age, and the level of banking competition" (Caprio and Demirguc - Kunt, 1998:174).

Because of data availability, empirical studies which examine cross country differences in the capital structure and in particular in the debt maturity structure have been few. Some of the results of Claessens (1998) study are reported in (Table 6) below.

Table 6
Long Term Debt to Total Debt for Nine Asian Countries, Germany & the US (% Medians)

Country	1990	1992	1994	1996	1988-1996
Hong Kong	53.8	44.7	40.7	36.4	44.9
Indonesia	n.a.	40.8	41.6	43.3	43.1
Japan	53.8	49.4	47.7	40.8	48.4
Korea	49.8	44.2	41.4	41.5	43.7
Malaysia	32.5	26.9	27.2	29.9	29.2
Phillippines	n.a.	53.1	50.2	51.4	52.2
Singapore	54.1	33.8	40.2	41.1	43.3
Taiwan	n.a.	44.4	34.6	38.9	35.9
Thailand	38.8	25.2	27.6	32.8	30.9
US	76.3	75.8	75.2	74.1	75.9
Germany	54.5	55.2	55.4	54.7	55.3

Source: Adapted from Claessens, 1998:11.

A look at Table (6), one can clearly see that "long - term debt (as a share of total debt) has been low across the whole period in all East Asian countries. Malaysia, Taiwan and Thailand stand out with less than 1/3. Japan and the Philippines have the highest share, while the others are about 0.43. In contrast, about 3/4 of debt of US corporates is long term, while in Germany the ratio is 0.55" (Claessens, 1998:11). Indeed, similar conclusions have been arrived at by Demirguc - Kunt and Maksinovic (1996). In other words, "firms in industrial countries clearly have more long term debt as a proportion of total assets. For example, the long - term debt to asset ratio of an average firm in Norway, with a per capital gross domestic product of $20,000, is five times greater than it is in Zimbabwe, with a per capita GDP of less than $1,000. And large firms have more long - term debt as a proportion of total assets and debt than do smaller firms" (Caprio and Demirguc - Kunt, 1998:178).

The Data and Methodology

The sample consists of accounting data for a total of 32 listed industrial companies. This number is thought to be sufficient because during the time period of this study (1994-1998) the number (average) of industrial companies was 45. The variables used in the study are defined as follows:

Lev (1) = Total Liabilities / Total Assets

Lev (2) = Total Liabilities / Total Equity

Age = No. of years since the establishment of the company

TA = Total Assets

RE = Retained Earnings

RETA = Retained Earnings / Total Assets

LTD = Long Term Debt

TFA = Total Fixed Assets

TA = Total Assets

CF = Cash Flow = net income plus depreciation

CR = Current Ratio (current assets / current liabilities)

To identify the main features of the capital structure, we report the mean values of the two measures of leverage (Lev (1) and Lev (2)) for each of the years 1994-1998 inclusive and for the whole time period 1994-1998. Furthermore, to study the determinants of the capital structure, we rely on correlations which provide a partial picture of relationships between the variables and on regression analysis which provides additional light on the causal relationships.

The explanatory variables used in this analysis of the capital structure include the followings:

1. Age

The latest year used in the analysis minus the year of establishment is the proxy measure for age. It must be pointed out here that a better measure of age would have been the latest year in the analysis minus the year in which the company got listed on the AB. However, due to the fact that there is not much difference between the listing years of the 32 companies, we used the establishment year instead. Having said that, it is felt that the used measure is still a good indicator of factor like the reputation of companies, experience in the market place and other intangibles which are expected to show some improvement by age and these indeed can affect (positively) the leverage ratios of companies.

2. Total Assets (TA)

It is argued by Titman & Wessels (1988) that large companies (measured by total assets) tend to be more diversified than smaller companies and hence their risk of bankruptcy is much lower. As a result, the relationship between leverage and size is expected to be positive.

3. Retained Earnings / Total Assets (RETA)

It has been argued by Bernanke and Gertler (1987) that companies with "strong" balance sheets can have relatively easier access to cheaper debt and hence to invest more. In other words, there is a "complementary effect" between retained earnings and liabilities. Hence, the expected relationship between (RETA) and leverage is positive.

To document the main features of the debt maturity structure, we report the mean values of long term debt to total assets (LTD/TA) for each of the years 1994-1998 and for the whole time period. Similarly, to examine the determinants of the debt maturity structure, correlation analysis and regression analysis are used. The explanatory variables include the followings:

1. Fixed Assets / Total Assets (FA/TA)

It is argued by Hart and Moore (1994) that fixed assets should be financed by long term sources of finance. In other words, the composition of debt and fixed assets should be matched and hence a positive relationship is expected.

2. Cash Flow / Fixed Assets (CF / FA)

Cash flow can be considered as an indication of a company's quality of credit worthiness. Indeed, it can be argued that companies with poor quality (cash flow position) can only borrow on a short term basis. Having said that, it must also be pointed out that companies with strong cash flow position may choose to borrow on a

short term basis to take advantage of the revelation of future good news on the cost of borrowing in the future (Schiantarelli and Srivastava, 1996, p.16). As a result, the expected relationship between (CF/FA) and debt maturity structure can be either positive or negative.

3. Total Debt / Equity (TD/E)

To the extent that liquidation risk is associated with short term debt, it is argued that highly leveraged companies tend to (when needed) take on more long term debt. This decision is taken to hedge against the enhanced liquidation risk which is associated with a higher degree of leverage.

4. Current Ratio (CR)

The relationship between current ratio and debt maturity structure is expected to be positive. This is based on the argument that companies with strong balance sheet positions find it easier to have access to long term finance sources.

5. Fixed Assets (FA)

The relationship between fixed assets and debt maturity structure is expected to be positive. This relationship is based on the argument that assets (fixed) can be used as collateral and bargaining power in obtaining long term credit.

The Empirical Results

In Tables (7 and 8) below, we report the mean ratios of leverage and mean ratios of long term debt to total debt for each of the years and for the whole time period 1994-1998.

It we examine these Two Tables (7 & 8), we can make the following observations. First, the presence of relatively very low ratios of total liabilities to assets. For example, an average of 42.50 percent is much lower than the 392.0 percent for Indonesian companies (Hussein, 1996), 299.4 percent for Japanese companies, 160.2 percent for Thai companies, 79.8 percent for American companies, and 153.5 percent for German companies (Claessens, 1998). This prevalence of low debt to asset ratios in Jordan might be due to a number of reasons.

While it is very difficult to disentangle all potential reasons, there is no doubt that the reluctance of Jordanian banks to provide industrial companies with large loans and the reliance of companies on retained earnings for the financing of investment projects, could be two possible reasons for the low leverage ratios. Moreover, the relative size and organization of the capital market in Jordan might have an impact on these tow rations. Second, the mean ratio of long term debt to total debt is low (5.48% during 1994-1998). To put this figure in per-

spective, it must be pointed out that "long term debt (as a share of total debt) has been low across the whole period (1988-1996) in all East Asian countries. Malaysia, Taiwan and Thailand stand out with less than 1/3. Japan and the Phillippines have the highest share, 1/2, while the others are about 0.43. In contrast. About 3/4 of debt of US corporations is long term, while in Germany the ratio is 0.55" (Claessens, 1998:11). Third, both measures of leverage reflect some increase in 1997 and 1998.

Table 7
Leverage Ratios (Descriptive Statistics)

Ratios	Mean (%)	Standard Deviation	Minimum	Maximum
1994				
Lev (1)	38.36	18.21	7.00	9.00
Lev (2)	101.96	169.22	8.00	914.00
1995				
Lev (1)	38.13	16.34	12.00	83.00
Lev (2)	81.23	88.63	14.00	484.00
1996				
Lev (1)	37.46	18.34	10.00	85.00
Lev (2)	89.93	121.04	11.00	555.00
1997				
Lev (1)	46.02	31.95	5.00	1.8800
Lev (2)	95.07	139.20	5.52	588.00
1998				
Lev (1)	52.53	52.44	4.00	281.00
Lev (2)	109.27	192.47	4.45	770.00
1994-1998				
Lev (1)	42.50	30.86	4.00	281.00
Lev (2)	95.49	145.14	4.45	914.00

Table 8
Long Term Debt / Total Debt

Years	Mean	Standard Deviation	Minimum	Maximum
1994	15.73	17.71	0.0000	62.00
1995	13.16	15.54	0.0000	53.00
1996	13.50	16.80	0.0000	55.00
1997	17.64	24.11	0.0000	100.00
1998	17.37	25.76	0.0000	100.00
1994-1998	15.48	16.42	0.0000	100.00

To examine the possible determinants of leverage, we estimate the following regression:

$$\text{Lev (1) or Lev (2)} = K + 2_1 \text{ Age} + 2_2 \text{ TA} + 2_3 \text{ RETA} + e$$

As expected, the coefficient estimates of TA and RETA are positive and significant (Table 9). In other words, large firms are highly leveraged and this might be due to the fact that they are able to reduce the risk of bankruptcy and their greater degree of diversification enables them to obtain debt more easily than smaller companies, In addition, the positive coefficient of RETA supports the argument put forward by Bernanke and Gertler (1987). Companies with strong balance sheets enjoy a lower cost of financing and tend to rely on debt to finance their investments. Although not significant, the coefficient of age is negative which indicates that old firms have smaller leverage ratios. This might be due to the fact that older companies have stronger reputations and hence find it easier to rely on equity capital.

Based on the above results, the fact that all used variables are randomly distributed (as seen in Table 10 above), the absence of multicollinearity between the independent variables (as seen in Table 9 above), the absence of any significant correlations in the estimated error terms (DW statistic in Table 9 above) and the value of the F statistic reported in Table (9), we can conclude that based on the time period 1994-1998, both TA and RETA are significant determinants of the capital structure of Jordanian industrial companies.

As far as the determinants of the debt maturity structure is concerned, we estimate the following regression

$$\text{LTD/TD} = K + 2_1 \text{ FA/TA} + 2_2 \text{ CF/FA} + 2_3 \text{ TD/E} + 2_4 \text{ CR} + 2_5 \log(\text{FA}) + e$$

and obtain the results reported in Table 11.

Table 9
Pooled Regression Results (1994-1998)

Variable	Lev (1)	Collinearity Statistic (VIF)	Lev (2)	Collinearity Statistic (VIF)
Constant	0.376		0.273	
	(6.706*)		(1.145)	
Age	-0.002	1.715	0.009	1.715
	(-1.020)		(0.838)	
TA	0.001	1.707	0.001	1.707
	(3.535*)		(5.471*)	
RETA	2.220	1.087	4.694	1.087
	(3.464*)		(1.719*)	
R^2 = 0.131			R^2 = 0.287	
DW = 1.737			DW = 2.122	
F Statistic = 7.825*			F Statistic = 20.892*	

*Significant at the 0.01 Level

Table 10
Kolmogorov - Smirnov Test of Normality

Variable	K-S Statistic	Significance
Age	0.089	0.004
TA	0.239	0.000
RETA	0.382	0.000

Table 11
Regression Analysis (Pooled)
1994 - 1998

Variable	Coefficient	t-statistic	Collinearity Statistic (VIF)
Constant	-0.5660	-3.548*	
FA/TA	+0.3690	+4.191*	1.655
CF/FA	-0.0034	-0.323	1.049
TD/E	+0.0138	+1.175	1.457
CR	+0.0075	+0.832	1.388
Log (FA)	+0.0798	+3.198*	1.409
R2 = 0.284			
F statistic = 10.642*			
DW statistic = 1.772			

*Significant at the 0.01 level

As expected, the coefficient estimates of FA/TA and FA are positive and statistically significant. While the other explanatory variables have the expected signs, they are not significant. In other words, based on the above results, it can be concluded that fixed assets divided by total assets and total assets are the only determining factors of the debt maturity structure of Jordanian industrial companies.

A Summary and Conclusions

In this paper we have documented the capital structure and the debt maturity structure of industrial companies listed on AB. Based on the time period 1994 - 1998, we can draw a number of conclusions.

First, Jordanian industrial companies have lower leverage ratios than companies in other countries like Germany, USA, Indonesia, Thailand, Japan and others.

Second, large firms (measured by total assets) are relatively more leveraged than small companies.

Third, positive and significant coefficient estimate of RETA indicate a positive relationship between retained earnings and leverage.

Fourth, Jordanian industrial companies have relatively low ratios of long term debt to total debt.

Fifth, fixed assets divided by total assets and total assets are significant determinant factors of the debt maturity structure of industrial companies.

Sixth, in all analysis, the coefficient of determination (R2) are relatively low. This indicates that there are other variables which affect the leverage ratios or the maturity structure of debt. For example, non-financial factors like management attitudes toward debt might be a factor in determining the capital structure.

The findings of this research are important for their policy and future research implications. First, authorities should encourage large and growing firms and firms with high retained earnings to increase their degree of leverage. Indeed, it is well-known that the cost of debt is, in general, less than the cost of equity. Second, banks should be encouraged to become more willing to lend more (preferably long term term) and hence to raise the quality of leverage in the Jordanian industrial companies.

Third, it is worthwhile examining, in future research papers, the relationship between the degree of leverage and the performance of companies. Moreover, relative to the findings of this research paper, future work should consider the attitudes of management toward debt and whether more debt is feasible in the case of the examined companies. Finally, it is hoped that the results of this research will encourage similar research about other Arab companies individually and on a cross-sectional basis.

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الملخص

هيكل رأس المال للشركات الصناعية المدرجة في الأردن

غسان محمد خير أومت
هيثم جميل النوباني
الجامعة الهاشمية

تختبر هذه الدراسة هيكل رأس المال للشركات المدرجة في بورصة عمّان. وباستخدام بيانات على مستوى الشركات تم احتساب متوسط نسبة الرفع المالي ومتوسط نسبة الديون طويلة الأجل إلى إجمالي الديون خلال الفترة ١٩٧٨ – ١٩٩٨. وبناء على النتائج الإحصائية وجد أن حجم الشركة والأرباح المحتجزة مقسومة على إجمالي الموجودات محددات ذات دلالة إحصائية للرفع المالي. وتبين أيضاً أن نسبة الأصول الثابتة إلى إجمالي الأصول وإجمالي الأصول هما المحددان الوحيدان لهيكل المديونية.

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