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The Relationship between Economic Growth and Capital Structure of Listed Companies: Evidence of Japan, Malaysia, and Pakistan

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1. INTRODUCTION

Corporate enterprise is a natural outcome of capitalism in the course of economic development. The underwriter firms and banks etc. initially meet the capital requirements of such enterprise. Later on it is the stock exchange that carries out redistribution of shares of the enterprise.

Corporate decisions on capital structure policy have long been a subject of debate and still remain an unresolved issue. The traditional view of capital structure was that it results in the weighted average cost of capital being U-shaped, which means that there exists as an optimal mix between debt and equity, at which point a firm's value is maximised. However, Modigliani-Miller (1958), in a world of no tax and no financial distress, proved that capital structure is irrelevant to explaining firm values. When company taxes are considered, the benefits from tax shield leads Modigliani-Miller (1963) to conclude that the value maximising capital structure is extreme leverage. In a subsequent paper Miller (1977), by introducing both corporate tax and personal taxes into the model, points towards irrelevance of capital structure for any particular firm.

Firm's behaviour in reality seems to indicate that it conforms to some "acceptable" mix between debt and equity. Behaviourally this can be explained by the tradeoff theory. The theory says that there are two opposing forces at work for a levered company. The positive forces are derived from tax savings due to the creation of interest tax-shield and the ensuing management discipline when companies employ debt in their capital structure. The negative forces are those associated with over leveraging, a situation where risk of default is reasonably high. The tradeoff theory is consistent with the traditional view that there exist an optimal mix between debt and equity.

Capital market is an important supplier of funds for economic and industrial growth of the country. Investment in infrastructure is necessary for a strong, flexible, and growing economy. Various country economic factors are analysed. However, the

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relationship between market capitalisation and GDP growth is not linear. At a certain level, the tax burden associated with financing and maintaining public capital reduces the returns to private industry, which, in turn, reduces growth.

2. OBJECTIVES OF THE STUDY

The current study is an attempt to add to existing literature on the relationship between economic growth and capital structure decisions of firms in three Asian countries: Japan, Malaysia and Pakistan. These countries are chosen in order to represent three different stages of economic development. One can hypothesise that capital market develops in tandem with general economic development. As capital market develops, firms tend to use more debt financing, as evidenced from various other studies [see for example Rajan and Zingales (1995)].

The specific objectives are as follows:

(1) to investigate if country's economic factors play a significant role in determining capital structure between markets;
(2) to investigate if capital structure is different across industry class in each country and across countries;
(3) to investigate firm specific factors influencing capital structure decision in each of the three countries. These factors are growth, size, fixed asset ratio, profitability, operating leverage and dividend policy;
(4) to examine the variations in the leverage ratios across countries, and as to whether such variations depend on macroeconomic variables.

3. PREVIOUS STUDIES

Author(s)	Scope of Study	Results
Toy, *et al*. (1974)	1966-1972, France, Japan, Holland, Norway and U.S.	Debt ratios, asset growth (+), earnings variability (+), earnings rate (–)
Remmers, *et al*. (1974)	1967-1972, Fortune 500 companies	Industry (0), size (0)
Scott and Martin (1975)	1967-1972, 12 industries	Industry class (s), size (s)
Ferry and Jones (1979)	1969-1976, 233 non-regulated firms	Industry (s), size (–), earnings variability (0)
Nakamura and Nakamura (1982)	1964-1974 for US firms 1966-1970 for Japan firms	Retained earnings (–), cost of debt (–), capital productivity(–), cost of equity (+)
Titman and Wessels (1983, 1988)	1974-1982, 469 manufacturing firms	Profitability (–), size (–), earnings variability (0), collateral value of fixed asset (0), future growth (0), non-debt tax shield (0), industry class (yes), asset uniqueness (–)

Continued—

Author(s)	Scope of Study	Results
Baskin (1989)	1960-1972, 378 Fortune 500 firms	Growth (+), profits (–), dividend (+)
Chang and Rhee (1990)	1969-1987, 508 US firms	Profitability (–), non-debt tax shield (+), growth (+), size (+), earnings variability (+)
Graham and Bromson (1992)	1980-1989, Australia, Hong Kong, Japan, South Korea, Taiwan and Thailand	Country effect (s), industry (Yes for Japan, S. Korea, No for Australia, Hong Kong, Taiwan, Thailand)
Homaifer, *et al.* (1994)	1978-1988, 370 US firms	Size (+) and future growth (+)
Rajan and Zingales (1995)	Japan, Germany, France, Italy, UK, Canada and US.	Accounting regulation (s), institutional environment (s), tangibility (+), market to book ratio (–), logsale (+), profitability (–)
Johnson (1997)	1985-1989, 847 US firms	Fixed asset ratio (+)

Note: + means positively related to leverage.
– means negatively related.
0 means no significant relationship.
s means significant.
? means mixed results.

4. DATA AND METHODOLOGY

This study is the updated sample data that contained in my PhD. research thesis (2000). The data was derived from various sources. Firm specific variables are obtained from company annual reports. The annual reports and macroeconomic variables are obtained from the Extel Company Research Services and Daiwa Securities Research Institute for Japan; PACAP Database of the University of Rhode Island for Malaysia; and Vital Information Services, Karachi for Pakistan. The sample includes only non-financial companies. It is also required that the companies are listed on the respective stock exchanges of the three countries over the ten-year period covered in this study, 1989 until 1998. The sample consists of 505 (29 percent of the number of companies on the stock exchange in 1998) firms from Japan, 109 (30 percent of the number of main board companies) from Malaysia and 104 (24 percent) from Pakistan.

There are several commonly used debt ratios in studies on capital structure. In the context of this study, our main issue of investigation is laid out on the premise of the static tradeoff theory, which, in simple terms states that some amount of debt is desirable, but too much of it brings in financial distress. In this light we are concerned with the total amount of debt used by a firm to finance its entire operation and firms ability to service the loans. We should therefore be concerned with total debt and total liability of the firms. The distinction between short-term and long-term debt is less useful due to the ability of firms to rollover short-term loans.

Nevertheless it would also be interesting and useful to study the behaviour of long-term debt because it traditionally forms an important component of capital.

In this study three leverage measures are used.

(1) Total liability (non-equity) to total asset ratio (TLA). The liability includes short-term liabilities and long-term loans. This measure reflects the amount of claims in book value terms in case of liquidation of the firm. It also reflects the residual value to shareholders.
(2) Total debt to equity (TDE). Total debt includes short-term loan and overdrafts, and long-term liabilities. This is truly a measure of leverage in the sense that fixed interest commitment acts as a lever to enlarge return to shareholders. This ratio is a linear transformation of another commonly used leverage measure, total debt to capital.
(3) Long-term debt to capital. Capital in this measure is defined as long-term-debt plus book value of equity. This truly measures the long-term financing mix of the company.

Based on earlier empirical studies on capital structure, it is found that there is quite a long list of firm-specific variables that have been investigated. In this study we tried to include as many variables as permitted by the data in order to have a comprehensive study on relationship between economic growth and capital structure in the three countries. The variables finally included are checked to ensure they are not highly correlated with one another. The following variables are included on our study:

(1) GRA. Growth in assets is defined as compounded annual growth of book value of total assets beginning from year 1989 until 1998. If growth in assets is high, firms may have to resort to external funding to finance its operation. In other words, if firms are growing at a faster pace than can be finance by internally generated funds, they have to resort to external funding. Depending on the pecking order of financing, growth may be expected to have a positive or a negative relationship with debt ratios. If firms prefer debt financing to new equity as in the US situation, positive relationship may be expected. But in Malaysia and many other Asian countries firms prefer new equity to debt [see for example, Kester and Isa (1994)]. In this case high growth may not be associated with high debt ratio.
(2) GRS. Growth in sales is defined as compounded annual growth rate of sales beginning from year 1989 until 1998. The expected relationship is similar to that for Growth in Assets (GRA). However, firms with high sales growth may experience a rapid increase in trade receivables and payables, and this may result in high total liabilities ratio but not necessarily increasing the debt ratios.

(3) SZA. Firm size as measured by book value of total assets. The general perception is that large firms are able to afford larger loans due to its large asset base. Hence the relationship between leverage and size is expected to be positive, and indeed many of the previous studies found a positive relationship. Again, this may be true if firms indeed prefer debt to equity in their financing hierarchy as in most developed countries. Positive relationship is found in many of the previous studies. It would be interesting to see if Asian managers manage capital structure in similar manner.

(4) SZS. Firm size as measured by total net sales. The expected relationship for this variable is similar to the above variable, SZA.

(5) FAR. Fixed asset ratio is represented by the proportion of fixed asset to total asset. Rajan and Zingales (1995) termed this ratio as "tangibility". Firms with high fixed asset component may be able to afford higher debt because of higher collateral value of their assets. Hence the relationship is expected to be positive.

(6) ROA. Profitability as measured by return on asset, that is, earnings before interest and taxes over book value of total assets. The nature of relationship of this variable against leverage is difficult to predict. For firms that has reached their maturity stage, more internally generated funds means less need for borrowing. On the other hand one may argue that profitable firms may be easier to obtain a bank loan, which may result in leverage increase, especially for growth firms.

(7) ROS. Profitability as measured by return on sales, that is, earnings before interest and taxes over total sales. The expected relationship is similar to the above variable, ROA.

(8) DOL. Degree of operating leverage is defined as the percentage in earnings before interest and taxes divided by the percentage change in sales. This variable measures the impact of fixed expenses used in a company to enhance earnings. A high proportion of fixed costs means a high business risk of the company, and lenders may be reluctant to provide loan. Hence the expected relationship between this variable and leverage is negative.

(9) DIV. Dividend policy is measured by annual gross dividend divided by total earnings available for distribution. Since dividends are cash outflow from the system, external funds need to be raised to finance firms operation. If managers prefer debt to equity, a positive relationship may be expected between this variable and leverage. But firms may pay high dividends simply because there is no growth opportunity. In this situation a non-positive relationship may appear. In most Asian countries in which many industries are growing, we expect a positive relationship provided managers prefer debt to equity in financing choice hierarchy.

Regression analysis is employed on cross-sectional data from 1989 to 1998 inclusive. This research measures per capita GNP growth, prime lending rate, creditor's rights and enforcement of country's economic development. Country's economic development may be represented by a number of indicators. Growth in per capita is a barometer of economic activities. Interest rate is selected because it may affect the demand for credit. The dummy variables are selected from the 1998-99 World Development Report to capture the specific financial liberalisation phenomenon and country's law and order situation. The following two measures are represented by dummy variables:

(1) creditors' rights;
(2) enforcement.

The other two measures use actual values:

(1) GNP growth per capita;
(2) prime lending rate.

5. RESULTS OF THE STUDY

5.1. Country Factor

Table 1 presents average leverage ratios included in this study by year and by country. The first ratio is total liability to total asset (TLA). Although Japan and Pakistan are at extreme ends of economic and capital market development, it is somewhat surprising that they both show similar proportion of total liabilities to asset ratio. Malaysia shows the lowest total liabilities ratio. Similar pattern is also observed with the other two leverage ratios across the three countries.

One explanation for Japanese companies to be aggressive in their financing structure is the Kieretsu system practiced in Japan, where the banking system has a close relationship with the firms. Further, capital market in Japan is the most advance among the three countries studied. Therefore it is not really surprising that Japanese companies are highly geared. Rajan and Zingales (1995) have also documented this evidence. But for Pakistan to have as high gearing as Japan is hard to explain. Since its capital market is largely undeveloped, it may be the case that companies find it difficult and expensive to float shares. The logical alternative for financing beyond internal funds is debt, although interest rate in Pakistan is high compared to the other countries (see also Table 2). Hence the high leverage of Pakistani companies is dictated by the circumstances of the financial environment as opposed to by managers' free choice.

For Malaysia, firms are traditionally conservative in their capital structure management. This has been documented in Kester and Isa (1994) and Tho (1993). It is quite common to find many companies not to have any long-term debt in their

Table 1

Average Leverage Ratios

	Total Liabilities to Assets Ratio (TLA)			Total Debt to Equity Ratio (TDE)			Long-term Debt to Capital Ratio (LTDC)		
	Japan N=505	Malaysia N=109	Pakistan N=104	Japan N=505	Malaysia N=109	Pakistan N=104	Japan N=505	Malaysia N=109	Pakistan N=104
1989	.61	.43	.60	2.44	1.30	2.35	.35	.15	.24
1990	.61	.40	.66	2.45	1.02	2.88	.35	.13	.34
1991	.60	.39	.67	2.36	0.91	2.97	.36	.11	.35
1992	.60	.38	.66	2.38	0.80	3.02	.36	.11	.36
1993	.59	.40	.69	2.34	0.90	3.40	.36	.13	.35
1994	.59	.40	.67	2.29	0.92	3.03	.35	.14	.33
1995	.92	.40	.68	2.71	0.92	3.21	.34	.14	.32
1996	.92	.39	.69	2.69	0.91	3.02	.36	.14	.35
1997	.91	.40	.68	2.70	0.89	3.09	.35	.15	.32
1998	.90	.41	.70	2.71	0.90	3.18	.35	.14	.36
Average	.73	.40	.67	2.51	0.95	3.02	.35	.13	.33

Note: Total liabilities include all non-equity liabilities. Total debt includes long-term and short-term debts. All values are in book-value terms.

Table 2

Country Analysis: Comparative Facts and Statistics That May Be Relevant to Capital Structure Decision

	Japan	Malaysia	Pakistan
Average TLA	0.64	0.40	0.64
Average TDE	2.55	0.98	2.83
Average LTDC	0.35	0.13	0.30
Accounting Standards	IASC & Japanese GAAP	IASC	IASC
Taxation	Interest Income (20%), Dividend (20%, 35%), Capital Gains (20%)	Interest, Dividend Taxable at Personal Rate, Capital Gains Non Taxable	Interest, Dividend Taxable at 10%, Capital Gains Non Taxable
Corporate Tax Rate,	26-40%	30%	30%-36%
Prime Lending Rate	2.38%	7.75%	11.53%
GNP Per Capita, 2001, USD	37950	3,531	450
Market Capitalisation, (USD)*	3,795 Billion	159 Billion	10 Billion
GDP Growth****	–0.6%	0.4%	2.7%
Inflation** 2001	–0.8%	1.4%	3.4%
Savings % of GDP**	30%	47%	15%
People per Telephone*	1.5	5.0	49.0
Literacy Rate***	100%	87%	43%

*ASIAWEEK, June 23, 2000.
** ASIAWEEK, November 23, 2001.
***World Development Report 2003.

capital structure. Their short-term debt and other liabilities are also at conservative levels. It is hard to provide a rational explanation for this behaviour. One possible reason is that it results from financing preferences of Malaysian business. As documented by Kester and Isa (1994), the financing hierarchy of Malaysian managers is quite different from those documented in the US. In Malaysia, managers' first choice of financing after internal funds is new equity as opposed to debt. The packing order of financing for Malaysia is quite different from the developed markets.

Table 1 also shows a remarkable stability in leverage ratios over the ten-year period, 1989–1998 covered in this study. However there is a slight tendency for Malaysia and Pakistan (more so for Pakistan) to show an increase in leverage over the years. The tendency to increase leverage over time has long been observed for the US market. This phenomenon should be expected because as the economy develops, market environment becomes more competitive and the most efficient form of financing would emerge.

Table 2 shows comparative facts and statistics on market and institutional factors that may be relevant in determining capital structure in each of the three countries. All the three countries employed an international standard for accounting purposes. The tax environment, however, differs somewhat. Interest and dividend are both taxable in all the three countries. However, capital gains are only taxable in Japan, not in Malaysia and Pakistan. Malaysian corporate tax rate may be slightly lower rate than Japan and Pakistan. But the gap may be too small to attribute to the significant difference in the leverage structure discussed above.

Various market and economic indicators amply demonstrate the difference in the stage of economic development between the three countries shown in Table 2. The interest rate in 1998 is lowest in Japan and highest in Pakistan. And yet the leverage in Pakistan is as high as Japan. As explained this may be due to the undeveloped equity market. Underdeveloped capital market in Pakistan is reflected in the small market capitalisation of the stock market and a very low GNP per capita, highest inflation and lowest savings rate. The market capitalisation and GDP growth is below the optimal level throughout much of the country and government spending is not always directed towards the types of investment that have the most positive effects on growth.

5.2. Industry Factor

Many studies in the past have documented that there exists a significant industry influence on capital structure. One of the reasons cited is that some industries would require heavy investments in fixed assets, which has been found to be a significant variable determining capital structure. This is because fixed assets are closely related to firms' collateral value and non-debt tax-shield. Other reason cited is that some industries may have a higher cost of bankruptcy and financial distress than other industries.

Tables 3a to 3c respectively presents analyses of the three leverage ratios in terms of industry influence. Each of the country samples is divided into 10 industry sectors, and one-way ANOVA is performed to test if the mean industry ratios are different from one another. The resultant F-statistics and associated probability values are shown at the bottom of the table. The tables, however, show only six of the ten industries analysed as these are the only common industry classification between the three countries.

Tables 3a to 3c clearly show that the industry influence on the three leverage ratios seems to be quite different from one country to another. For Japan, industry factor is clearly significant for all leverage ratios. However, Malaysia and Pakistan show significance for the liabilities ratio but marginal significance for the two debt ratios. Across countries it is found that heavy industries, such as construction, chemicals, electric and gas companies tend to have higher leverage ratios than other industries. Light industries like food and beverages and transport services tend to have low debt ratios. This is consistent with our prediction that the high proportion of fixed assets required in these industries may drive leverage.

5.3. Size Factor

Firm size as measured by total asset is expected to have a positive influence on leverage. This is because the larger the asset base of a company the more capable it is to obtain a bank loan or to issue debt securities. Evidence on size effect on capital structure has been somewhat mixed, but showed strong bias towards a positive relationship. For example, Ferry and Jones (1979), Scott (1977), Chang and Rhee (1990), Harris and Raviv (1991) and Homaifer and Benkato (1994) found positive relationship between size and leverage. However, Titman and Wessel (1988), Fischer, *et al.* (1989) finds that short-term debt is negatively related to leverage.

To study the effect of size on capital structure firms are divided into five size groups. Firm size is based on year-end total assets, which are translated into US dollar for common denomination. In this way firm size in each size group is the same for all countries. The groups are revised annually. Tables 4a to 4c respectively summarise the results of ANOVA analysis for each of the three ratios. Each table shows the average means and its corresponding standard deviations for year 1989 and 1998, that is the beginning and ending of the period of study. F-statistics and probability values are shown in the last two rows of the table.

For Japan, there is a clear demonstration of the size effect on capital structure where large firms show a higher gearing compared to small firms. For total liabilities ratio, the largest firm ratio is about 30 percent higher than that for the smallest firm. For debt-equity ratio the difference is even greater, more than 100 percent, whereas for long-term debt to capital the largest firm ratio is about 72 percent higher than the smallest firm. Comparing the results for the year at the beginning of the study period, 1989 and the year at the end, 1998 it can be observed that there is a remarkable

Table 3a

Total Liabilities to Assets Ratio by Industrial Sectors in the Three Countries

	Japan		Malaysia		Pakistan	
Industry Type	1989	1998	1989	1998	1989	1998
Chemicals	.625	.570	.356	.439	.659	.655
(N=94,6,8)	(.183)	(174)	(.158)	(.156)	(.215)	(.263)
Construction	.797	.777	.387	.425	.664	.756
(N=55,20,5)	(.101)	(.136)	(.215)	(.138)	(.119)	(.101)
Electric Machinery	.546	.548	.411	.487	.747	.715
(N=97,5,5)	(.197)	(.195)	(.168)	(.215)	(.055)	(.094)
Food and Beverages	.567	.552	.425	.445	.509	.797
(N=42,12,8)	(.148)	(.165)	(.166)	(.187)	(.187)	(.102)
Natural Resources	.769	.765	.207	.276	.626	.814
(N=25,21,6)	(.144)	(.121)	(.172)	(.160)	(.233)	(.098)
Transport Equipment	.663	.659	.344	.433	.673	.739
(N=50,6,7)	(.161)	(.183)	(.151)	(.105)	(.207)	(.125)
F-ratio	14.15	11.57	3.26	2.48	2.84	3.55
Prob-value	0.001	0.000	0.002	0.016	0.005	0.002

Notes: 1. The figures in parenthesis indicate standard deviation.

2. Many of the industrial sectors do not have similar labels across countries—they are assumed similar based on broad classification. Listed below are specific country classification of the groups that have been assumed similar:
   - Construction: Construction for Japan, Properties and Construction for Malaysia and Building Material for Pakistan.
   - Electric Machinery for Japan, Electricals for Malaysia and Cable and Electric for Pakistan.
   - Natural Resources: Electric, Power and Gas for Japan, Plantation for Malaysia, and Gas and Energy for Pakistan.

Table 3b

Total Debt to Equity Ratio by Industrial Sectors in the Three Countries

	Japan		Malaysia		Pakistan	
Industry Type	1989	1998	1989	1998	1989	1998
Chemicals	2.77	2.09	.643	.904	4.06	3.65
(N=94,6,8)	(2.83)	(2.62)	(.466)	(.559)	(.5.32)	(.322)
Construction	5.44	5.55	.853	.832	2.21	3.08
(N=55,20,5)	(3.66)	(4.02)	(.757)	(.431)	(.852)	(.132)
Electric Machinery	1.99	1.76	.818	1.45	2.96	2.89
(N=97,5,5)	(2.22)	(1.47)	(.513)	(1.18)	(.812)	(1.66)
Food and Beverages	1.64	1.61	.915	1.15	1.46	6.14
(N=42,12,8)	(.97)	(1.16)	(.666)	(.866)	(.139)	(5.87)
Natural Resources	5.11	4.15	.349	.458	3.16	5.95
(N=25,21,6)	(4.17)	(2.20)	(.472)	(.384)	(3.13)	(3.86)
Transport Equipment	3.12	2.95	.583	.855	3.59	4.09
(N=50,6,7)	(2.90)	(2.39)	(.345)	(.257)	(3.81)	(3.76)
F-ratio	12.29	12.46	4.03	2.12	1.26	1.92
Prob-value	0.000	0.000	0.003	0.038	0.267	0.066

Notes: 1. The figures in parenthesis indicate standard deviation.

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   - Natural Resources: Electric, Power and Gas for Japan, Plantation for Malaysia, and Gas and Energy for Pakistan.

Table 3c

Long-term Debt to Capital Ratio by Industrial Sectors in the Three Countries

	Japan		Malaysia		Pakistan	
Industry Type	1989	1998	1989	1998	1989	1998
Chemicals	.376	.312	.082	.189	.169	.354
(N=94,6,8)	(.198)	(.199)	(.098)	(.156)	(.178)	(.103)
Construction	.352	.398	.133	.191	.335	.546
(N=55,20,5)	(.142)	(.207)	(.132)	(.143)	(.289)	(.175)
Electric Machinery	.296	.276	.076	.258	.187	.278
(N=97,5,5)	(.176)	(.166)	(.042)	(.253)	(.146)	(.495)
Food and Beverages	.274	.280	.104	.090	.071	.109
(N=42,12,8)	(.154)	(.169)	(.094)	(.084)	(.119)	(.047)
Natural Resources	.618 (.223)	.624	.064	.086	.296	.318
(N=25,21,6)		(.228)	(.085)	(.115)	(.265)	(.395)
Transport Equipment	.360	.351	.093	.108	.331	.344
(N=50,6,7)	(.196)	(.190)	(.090)	(.143)	(.253)	(.193)
F-ratio	14.26	11.21	1.34	1.89	1.95	1.84
Prob-value	0.000	0.000	0.249	0.064	0.054	0.085

Notes: 1. The figures in parenthesis indicate standard deviation.

2. Many of the industrial sectors do not have similar labels across countries—they are assumed similar based on broad classification. Listed below are specific country classification of the groups that have been assumed similar:
   - Construction: Construction for Japan, Properties and Construction for Malaysia and Building Material for Pakistan.
   - Electric Machinery for Japan, Electricals for Malaysia and Cable and Electric for Pakistan.
   - Natural Resources: Electric, Power and Gas for Japan, Plantation for Malaysia, and Gas and Energy for Pakistan.

Table 4a

Analysis of Variance for Mean Differences among Five Size Groups in Terms of Total Liabilities to Total Assets Ratio

	Japan		Malaysia		Pakistan	
Size Quintile	1989	1998	1989	1998	1989	1998
Group 1	.6127	.5569	.3050	.3050	.5887	.8609
(Smallest)	(.195)	(.196)	(.215)	(.185)	(.181)	(.245)
Group 2	.6237	.5734	.4130	.4290	.5058	.5906
	(.179)	(.187)	(.207)	(.250)	(.206)	(.249)
Group 3	.6132	.6063	3590	.3960	.6243	.7427
	(.192)	(.200)	(.158)	(.118)	(.179)	(.076)
Group 4	.7232	.6460	.4040	.3790	.6456	.6177
	(.170)	(.183)	(.240)	(.170)	(.173)	(.206)
Group 5	.7412	.7170	.4820	.4300	.7089	.6780
(Largest)	(.153)	(.165)	(.153)	(.187)	(.163)	(.163)
F-ratio	9.166	12.72	1.968	1.009	3.043	1.765
Prob-value	0.000	0.000	0.104	0.409	0.021	0.144

Note: Figures in parentheses are standard deviations.

Table 4b

Analysis of Variance for Mean Differences among the Five Size Groups in Terms of Debt-Equity Ratio

	Japan		Malaysia		Pakistan	
Size Quintile	1989	1998	1989	1998	1989	1998
Group 1	2.470	1.890	.6130	.5550	1.860	4.430
(Smallest)	(2.33)	(1.74)	(.614)	(.530)	(1.11)	(7.14)
Group 2	2.760	1.860	.9840	1.259	1.730	2.010
	(3.20)	(1.41)	(.909)	(1.44)	(2.49)	(1.27)
Group 3	2.560	2.510	.6730	.7040	2.680	3.230
	(2.45)	(2.66)	(.627)	(.285)	(2.78)	(1.57)
Group 4	4.400	3.380	1.110	.7440	2.900	3.020
	(4.03)	(3.98)	(1.30)	(.525)	(3.51)	(4.15)
Group 5	4.580	4.010	1.100	1.046	4.420	3.260
(Largest)	(3.71)	(3.21)	(.687)	(1.00)	(4.68)	(3.20)
F-ratio	9.278	13.07	1.571	1.482	1.958	0.316
Prob-value	0.000	0.000	0.188	0.213	0.106	0.865

Note: Figures in parentheses are standard deviations.

Table 4c

Analysis of Variance for Mean Differences among the Five Size Groups in Terms of Long-term Debt to Capital

	Japan		Malaysia		Pakistan	
Size Quintile	1989	1998	1989	1998	1989	1998
Group 1	.311	.267	.060	.106	.274	.086
(Smallest)	(.188)	(.182)	(.070)	(.138)	(.244)	(.220)
Group 2	.338	.289	.112	.128	.138	.219
	(.170)	(.173)	(.112)	(.160)	(.195)	(.222)
Group 3	.345	.325	.137	.110	.330	.275
	(.167)	(.180)	(.126)	(.120)	(.286)	(.219)
Group 4	.449	.377	.163	.113	.225	.255
	(.180)	(.205)	(.182)	(.123)	(.214)	(.221)
Group 5	.524	.461	.209	.168	.310	.382
(Largest)	(.220)	(.228)	(.137)	(.152)	(.217)	(.212)
F-ratio	18.90	16.96	3.89	0.95	2.19	2.90
Prob-value	0.000	0.000	0.005	0.437	0.076	0.026

Note: Figures in parentheses are standard deviations.

stability in the size effect. The results for Japan are consistent with most of the previous studies on other developed markets.

The results for both Malaysia and Pakistan do not seem to indicate strong presence of the size effect in capital structure. For Malaysia although the smallest firm group tend to show the lowest gearing and the largest firm shows the highest, but the relationship of intermediate size groups is not monotonous. For Pakistan there is no clear trend that can be observed. However, the second smallest group seems to show the lowest leverage ratios. Interestingly, the highest liabilities ratio and debt-equity ratio shifted from the largest firm group in the beginning of the period to the smallest group firm at the end of the period. This trend, however, is not observed for the long-term debt to capital ratio. In summary, the results in this section indicate a clear presence of capital structure size effect in Japan, but not in Malaysia and Pakistan.

5.4. Firm-specific Factors

If firms make capital structure decisions as if there exist an optimal mix between debt and equity, it would be both interesting and useful to know what are the factors that determine such decisions. Many researchers, using many firm-specific variables, have studied this area of investigation. Based on a survey on previous studies we came up with more than a dozen variables. However, some of them are simply variations of each other. After performing a correlation test, we

finally arrive at nine firm-specific variables for the current study. A pooled time-series cross sectional regression was run with the leverage ratios as dependent variables against the nine firm-specific factors as independent variables. The following three regressions are run for each country:

$$TLA; = \alpha; + \beta_1 GRA; + \beta_2 GRS; + \beta_3 SZA; + \beta_4 SZS; + \beta_5 FAR; + \beta_6 ROA; + \beta_7 ROS; + \beta_8 DOL; + \beta_9 DIV; \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

$$TDE; = \alpha; + \beta_1 GRA; + \beta_2 GRS; + \beta_3 SZA; + \beta_4 SZS; + \beta_5 FAR; + \beta_6 ROA; + \beta_7 ROS; + \beta_8 DOL; + \beta_9 DIV; \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

$$LTDC; = \alpha; + \beta_1 GRA; + \beta_2 GRS; + \beta_3 SZA; + \beta_4 SZS; + \beta_5 FAR; + \beta_6 ROA; + \beta_7 ROS; + \beta_8 DOL; + \beta_9 DIV; \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

Where:

TLA = total liabilities to total asset ratio.
TDE = total debt to equity ratio.
LTDC = long-term debt to capital ratio.
GRA = annual growth in asset.
GRS = annual growth in sales.
SZA = total asset.
SZS = total sales.
FAR = fixed asset ratio = net fixed assets = total assets.
ROA = annual return on asset = EBIT = total asset.
ROS = return on sales = EBIT = sales.
DOL = degree of operating leverage = A percent in EBIT = o percent in sales.
DIV = dividend payout ratio = total gross dividend paid = total earnings after tax.

The results of the regressions are presented in Tables 5a to 5c. Looking across the tables the results indicates that each leverage ratio is driven by different factors, and the factors are also different across countries. This makes it difficult to draw general observations across debt ratios and across countries.

For total liabilities ratio, total assets, sales, fixed asset ratio, return on assets and return on sales, but some with unexpected signs drive Japan. The negative relationship between liabilities and sales goes against our prediction. Similarly, the relationship is also negative for return on sales. One possible explanation is that as sales increases, and as profitability increases, more internal funds are generated and this leads to a lesser need for external financing. In fact the internal funds thus generated may be used to retire debt. This is especially true for mature industries where there is zero or little growth as may be the case with many Japanese industries. The negative relationship with the fixed asset ratio is difficult to explain.

Table 5a

Regression Results of Total Liabilities to Total Assets (TLA) Ratio on the Firm-specific Factors

$TLA; = \alpha; + \beta 1GRA; + \beta 2GRS; + \beta 3SZA; + \beta 4SZS; + \beta 5FAR; + \beta 6ROA; + \beta 7ROS; + \beta 8DOL; + \beta 9DIV;$

	Japan (N=505)		Malaysia (N=109)		Pakistan (N=104)	
Variables	Coefficient	*t*-stat	Coefficient	*t*-stat	Coefficient	*t*-stat
Constant	0.5662	40.5	0.4983	13.52	0.6537	16.15
GRA: Growth in Assets	0.0445	1.49	0.1851	3.21**	0.3545	5.49**
GRS: Growth in Sales	–0.0276	–1.25	0.2587	5.35**	–0.0396	–0.74
SZA: Total Assets	0.0234	6.22**	0.0547	2.14*	–0.0542	–0.57
SZS: Net Sales	–0.0263	–4.52**	–0.0296	–1.02	0.1646	2.29*
FAR: Fixed Asset Ratio	–0.1001	–5.63**	–0.1975	–5.03**	–0.0655	–1.30
ROA: Return on Assets	0.1348	3.01**	–0.7316	–6.35**	–0.4003	–6.58**
ROS: Return on Sales	–0.3945	–10.01**	–0.0131	–1.06	–0.2243	–1.22
DOL: Degree of Operating Leverage	–0.0002	–0.15	–0.0005	–1.22	0.2336	1.25
Div: Dividend Payout Ratio	–0.007	–1.31	–0.0422	–1.60	0.0135	1.99
Adj. R^2	0.83		0.56		0.79	

*Significant at least at 5 percent level.
**Significant at least at 1 percent level.

Table 5b

Regression Results of Total Debt to Equity (TDE) Ratio on the Firm-specific Factors

$TDE; = \alpha; + \beta 1GRA; + \beta 2GRS; + \beta 3SZA; + \beta 4SZS; + \beta 5FAR; + \beta 6ROA; + \beta 7ROS; + \beta 8DOL; + \beta 9DIV;$

	Japan (N=505)		Malaysia (N=109)		Pakistan (N=104)	
Variables	Coefficient	*t*-stat	Coefficient	*t*-stat	Coefficient	*t*-stat
Constant	3.3313	17.01	1.4724	9.96	3.3461	4.88
GRA: Growth in Assets	–1.8731	–4.17**	0.5892	1.82	2.0841	1.86
GRS: Growth in Sales	0.3323	0.99	0.8477	3.93**	–0.8981	–0.85
SZA: Total Assets	0.5904	6.59**	0.0620	0.48	–3.5546	–2.21*
SZS: Net Sales	–0.5401	–5.55**	0.1263	0.94	0.5153	3.97**
FAR: Fixed Asset Ratio	–1.3908	–4.52**	–0.7181	–4.44**	–0.8189	–0.85
ROA: Return on Assets	–0.3301	–0.42	–4.2126	–7.21**	–0.7160	–6.44**
ROS: Return on Sales	–2.9851	–4.94**	–0.0891	–1.82	–1.5090	–3.01**
DOL: Degree of Operating Leverage	–0.0003	–0.22	–0.0018	–0.78	0.0012	3.16**
Div: Dividend Payout Ratio	–0.00084	–1.12	–0.1939	–0.15	0.4215	1.88
Adj. R^2	0.77		0.27		0.68	

*Significant at least at 5 percent level.
**Significant at least at 1 percent level.

Table 5c

Regression Results of Long-term Debt to Capital (LTDC) Ratio on Firm-specific Factors

$LTDC; = \alpha; + \beta 1GRA; + \beta 2GRS; + \beta 3SZA; + \beta 4SZS; + \beta 5FAR;$
$+ \beta 6ROA; + \beta 7ROS; + \beta 8DOL; + \beta 9DIV;$

	Japan (N=505)		Malaysia (N=109)		Pakistan (N=104)	
Variables	Coefficient	*t*-stat	Coefficient	*t*-stat	Coefficient	*t*-stat
Constant	0.3280	22.44	0.1513	5.25	0.0651	1.63
GRA: Growth in Assets	0.1547	5.22**	0.2302	5.66**	0.2448	3.26**
GRS: Growth in Sales	–0.1514	–5.42**	0.0951	2.78**	0.0872	1.31
SZA: Total Assets	0.0395	5.54**	0.0564	3.10**	0.4238	3.80**
SZS: Net Sales	–0.0510	–1.88	–0.0434	–2.23**	–0.1240	–1.55
FAR: Fixed Asset Ratio	0.1022	5.90**	–0.0137	–0.70	0.3574	5.48**
ROA: Return on Assets	–0.0408	–0.70	–0.4344	–5.47**	–0.4890	–6.42**
ROS: Return on Sales	–0.2724	–5.38*	–0.0125	–1.87	–0.1581	–0.77
DOL: Degree of Operating Leverage	0.0001	0.09	–0.0003	–0.90	0.2408	0.87
Div: Dividend Payout Ratio	–0.0007	–1.41	–0.0014	–0.09	0.0224	2.42*
Adj. R^2	0.76		0.44		0.73	

*Significant at least at 5 percent level.
**Significant at least at 1 percent level.

For Malaysia, the liabilities ratio is driven by growth in assets and sales, total assets, fixed asset ratio and return on sales. For Pakistan the driving factors are growth in assets, sales and return on assets. The only common variable across countries is return on assets. However, the relationship for Japan is positive whereas it is negative for Malaysia and Pakistan. The positive relationship is consistent with our expectation and with our earlier results on the existence of the size effect for Japan. The negative for Malaysia and Pakistan may be superior as our earlier analysis on size effect show no significant relationship.

Table 5b on total debt to equity ratio shows similar confusion as those in Table 5a. However, Table 5c on long-term debt to capital ratio shows an interesting result, that is, two variables are found to be important across countries in explaining long-term debt ratio. The variables are growth in assets and total assets, and both show a positive relationship with long-term debt ratio. This result is consistent with our expectation.

For Japan, it is found that there are two pervasive variables that show significant relationship with all three leverage ratios. These are total assets, with a positive sign and return on sales with a negative sign. One possible interpretation is that profitable firms with large asset base are using their internally generated funds to reduce debt burden.

There are also two pervasive variables for Malaysia, but the variables are different from those for Japan. Malaysia's leverage is positively related to growth in sales, but negatively related to return on assets. The positive relationship between leverage and growth in sales is consistent with the findings of previous researchers. It can be explained by the fact that growth companies are successful companies and may be easier to obtain loans. But the negative relationship between leverage and return on assets seem to indicate an opposite effect, that is profitable and efficiently run firms tend to reduce their debt burden. Similar explanation can be offered to the situation in Pakistan where only one pervasive variable is found, that is return on asset, which is negatively related with leverage.

6. CONCLUSION

The current study investigates factors affecting firms capital structure decisions in three Asian countries: Japan, Malaysia and Pakistan. These countries are chosen to represent different stages of economic and corporate environments. The factors considered are capital market development, industry and firm factors. Firm factors include growth, size, fixed asset ratio, profitability, operating leverage and dividend policy.

It is found that firms in Japan, and surprisingly in Pakistan show very high leverage ratios with total debt to capital ratio amounting to more than 70 percent. For Malaysia the ratio is about 50 percent. The high gearing for Japanese companies is to be expected in view of its developed market status. But for Pakistan, the gearing is more due to undeveloped capital market which forces firms to opt for bank loans as opposed to raising new equities. Good economic policy requires both increasing the market capitalisation and reorienting of government spending from consumption to investment in physical capital stock. Malaysia's conservative financing management may be due to the lack of competition in the market.

As a powerful anti-poverty tool, micro-credit has demonstrated relevance to poor people. Micro credit programmes extend small loans to poor people for self-employment projects that generate income, allowing them to care for themselves and their families. In most cases, micro credit programmes offer a combination of services and resources to their clients in addition to credit for self-employment. These often include savings, training, network and peer support. Interest rates are high in Pakistan as compared to Japan and Malaysia. The Government of Pakistan should undertake the following reforms.

- Strengthen the legal and judicial reform laws to allow financial institutions to foreclose on collateral in the case of unpaid loans without going through lengthy court proceedings.
- Improve the National Savings Scheme.
- Allow and encourage consolidation of small financial institutions to reduce fragmentation in the financial sector.

Industry influence is the strongest in Japan and Pakistan. Textile industry is the largest industry in Pakistan. It has an important role in the development of the economy (about 9 percent share in GDP). The study showed that textile industry is very much neglected in Pakistan. The Government should take such measures that could increase the quality production of cloth and export of textile products to other countries.

For Malaysia, there are some elements of industry influence, but not consistent across different leverage ratios. Lack of industry influence in Malaysia may be due to aggressive diversification of activities at firm level.

The results for firm-specific factors are largely mixed. Size factor is positively related to leverage in Japan, but not in the other two countries studied. There is a tendency for asset related variables, such as growth in asset, total asset, fixed asset ratio and return on asset to be important determinant of capital structure, while sales related variables such as sales growth, total sales and return on sales to be less important. Degree of operating leverage and dividend policy are found to be not important.

It was noted that growth in GNP per capita, which proxies for economic activities in the country, was significantly affecting growth in the capital structure of companies in Japan and Malaysia. Although this variable was insignificant when regressed inclusive three countries. For Pakistan this variable remains insignificant with all the three leverage ratios. The interest rate, which is measured, by prime lending rate, is a major decisive factor affecting demand for credit in Japan and Malaysia. Japanese companies are more leveraged companies than Malaysian companies. Therefore Japanese companies save tax and take more debt. Malaysian companies are risk averse and look consciously at interest. Prime lending rate appeared unexpectedly positively related to three leverage ratios in Pakistan. Pakistani companies take risk therefore very low investment is carried out in the manufacturing sector.

It is revealed from the analysis that creditor's rights provide significant impact on capital structure of companies and overall corporate sector in all the three countries. The indicator law enforcement appeared negatively significant with debt to equity and long-term debt to total capital ratio. This indicator was, perhaps not representing the country's overall law and order situation in Japan, Malaysia, and Pakistan.

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