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Does Financial Structure Affect New Investment and Sales Growth of Financially Distressed Malaysian and Thai Firms?

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Abstract: Thid paper investigates the relationship between a firm's financial structure, investment and sales growth. It seeks to establish whether differences in the financial structure of selected Malaysian and Thai firms can explain significant variations in the investment and sales performance after these firms become financially distressed. The results suggest that financial structure does impact on distressed firms' investment and sales performance. Proxies for the strength of bank ties are positively associated with higher investment by Thai-distressed firms. For sales, the results are exactly the opposite. The paper puts forward several institutional arguments to explain these differing outcomes.

1. Introduction

This paper investigates the relationship between a firm's financial structure, and its new investment and sales growth when it becomes financially distressed. The paper seeks to establish whether differences in the systems of industrial finance, or more precisely, the financial structure of Malaysian and Thai firms can explain significant variations in the investment and sales performance of these firms after they become financially distressed. The study attempts to shed light on the efficiency of the systems of industrial finance which exist in two countries that have achieved sustained high rates of growth over the last two decades. For instance, studies have found that banks and industry in Thailand maintain a close relationship, which can benefit these firms when they experience temporary cash flow problems. In contrast, Malaysian banks and industry do not maintain strong ties and bank loans account for a small share of investment.[1]

There is growing literature that argues that agency problems and information asymmetry between owners and investors can affect investment and sales performance, especially when firms become financially distressed. This literature departs from the financial structure irrelevance and perfect market arguments of Modigliani and Miller (1958) and focuses on the capital market imperfections and disparities in the access of individual firms to market funds. Myers and Majluf (1984), for example, argue that in imperfect markets, investment may depend on financial factors such as the availability of internal finance and access to external funds. The impact of financial factors are likely to be greatest during periods of financial distress, when capital market information problems are most acute (Fazzari, Hubbard and Petersen 1988) and the market is unable to ascertain the firm's true future prospects (Akerlof 1970; Stein 1989).

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[1] These are some of the conclusions of my Ph.D. (1999) dissertation (unpublished) "An analysis of industrial finance systems: A comparison of Malaysia and Thailand".

Several studies have found that firms do indeed incur costs when they become distressed. Altman's (1984) study is perhaps one of the best known. Using a sample of firms, which later became bankrupt, Altman finds that financial distress undermines a firm's profitability and its market share. Although this study does not properly control for the fact that sales decline may precipitate financial distress, Opler and Titman's (1994) work, which controls for this reverse causality, supports Altman's earlier main finding that distressed firms lose substantial market share to their less-distressed counterparts. Similarly, Cutler and Summers's (1988) study of a court dispute between Pennzoil and Texaco reveals that Texaco suffered a substantial decline in its operations after a USD10 billion judgement against the firm affected its ability to raise capital.[2]

Other studies have shown that a firm's financial structure can affect the costs it faces when it becomes financially distressed. For instance, financial distress can be quite costly for firms with diffusely held debts, since the greater the number of creditors, the more difficult it is for a distressed firm to renegotiate its financial claims with creditors. Bulow and Shoven (1978) note that one reason for this is that free-rider problems reduce the incentives for creditors to grant financial relief, such as interest and principal concessions, since an individual creditor bears the full cost of these decisions, but shares the benefits. Furthermore, because small creditors are less likely to monitor their investment, many of them may not know whether it is wise to continue to provide credit to distressed firms. Problems of this nature are likely to reduce the firm's access to credit, increase its premium on market capital and severely affect its investment and efficiency.

Hoshi, Kashyap and Scharfstein (1990) examine whether a firm's financial structure may help to avoid some of these costs of distress for a set of Japanese firms. Their basic argument is that if free-rider problems and information asymmetries make it difficult for firms to renegotiate with their creditors in times of distress, firms with financial structures in which free-rider and information problems are likely to be small should perform better than other firms after the onset of distress. Consistent with this view, they find that Japanese distressed group firms which have close ties with banks and creditors and which should suffer less from information and free-rider problems, performed better after they became distressed than firms without such ties. They also find that distressed firms, which are not part of a group, but which, maintain close ties with a bank also invest and sell more in the post-distress period than firms without such ties.

Petersen and Rajan (1994), Cole (1998) and Harhoff and Körting (1998) also provide strong evidence in support of these results. These studies find that lending relationships increase the availability of bank credit and reduce the cost of credit to firms that maintain long-term ties with banks. One interesting aspect of these studies is that they examine small US and German firms, which tend to be particularly prone to information and incentive problems, since they are less likely to be monitored by the financial press and potential investors. But another interesting aspect of these results is that they suggest that even in a competitive market-based economy such as that in the US, banks appear to value long-term relationships with their clients.

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[2] Notwithstanding this, there is still no consensus on whether financial distress lowers corporate efficiency. Jensen (1989) and Wruck (1990) argue that because some firms may be forced into making difficult value maximising choices, distress may raise firm value. Andrade and Kaplan's (1998) study, which finds that sample firms do experience an increase in value after becoming distressed, support this view.

These studies together suggest that firms with financial structures that help to minimise information and agency problems, that is, firms with a close relationship with banks and which are able to renegotiate their financial claims with the main creditors, may avoid much of the costs associated with financial distress and may therefore continue to invest and grow even though they experience temporary cash flow problems or financial distress. Firms in bank-based countries are better able to mitigate agency conflicts and asymmetric information than those in market-based countries where these close ties do not normally exist. If bank-firm ties have value, Thai firms that maintain closer ties with their banks and other creditors should suffer less when they become financially distressed than their Malaysian counterparts.

We would therefore expect that variables which capture differences in the financial structures of firms in the two countries to have a more positive impact on the investment and sales performance of Thai-distressed firms than their Malaysian peers. To investigate this, we use multivariate regression analysis to explain the impact of financial structure on variations in the investment and sales performance of firms in the two countries, after controlling for a number of factors that influence these variations. To check whether the variations that we find are related to financial distress, we analyse distressed samples and replicate the analysis on a pooled sample of distressed and non-distressed firms, using dummy variables to pick up differences in the behaviour of the two types of firms.

The rest of the paper is organised as follows: Section 2 describes the sample and data. Section 3 provides an analytical description of financial and operating characteristics of sample firms before, during and after firms become distressed. Section 4 discusses the regression results relating financial structure to distress costs, and Section 5 concludes.

2. Sample Selection and Data

To study the impact of financial structure on the costs experienced by distressed firms, we selected a sample of firms which had experienced operating cashflow problems. Following Hoshi, Kashyap and Scharfstein (1990), we defined firms in financial distress as those experiencing two consecutive years of interest coverage shortfall. Interest coverage is defined as profit before interest and tax (operating income) divided by interest expense. In effect, the operating incomes of these firms with interest coverage shortfall are insufficient to cover their interest expense. From their interviews with Japanese business people, Kawai *et al.* (1996) found that two consecutive years of negative profits tend to arouse bank concerns about the health of their clients. This suggests that the two consecutive years of interest coverage shortfall criterion may be a suitable indicator of corporate distress for Asian firms.

The data for this analysis came from Company Analysis of the Extel Financial database. The database updated in March 1998 contained financial reports for 578 Malaysian and 344 Thai non-financial listed companies. Since the analysis focused on firms making physical investment and generating sales in the product market, financial companies were excluded as their investment and sales were primarily of a financial nature. Only listed companies were available in the database, hence only listed firms were included in the sample.

The non-financial companies in the database had varying number of years of accounting data available, ranging from one to fourteen years. Firms were selected if they had operating income in one year sufficient to cover their interest payments (that is, interest coverage greater than one), but less in the next two years. Hence, firms must have had at least one year of "normal" operations, followed by two consecutive years of interest coverage shortfall (distress period). In addition, firms must have at least two years of data following the distress period (post-distress). Post-distress data were required to see how these firms respond to problems.

Eighteen per cent of the Malaysian firms in the database had interest coverage shortfall at least once during the period for which data were available; the equivalent figure for Thailand was 29 per cent. For firms with five or more years of data, 52 Malaysian and 53 Thai firms had two or more consecutive years of interest coverage shortfall. Of these, only 15 Malaysian and 21 Thai firms met the specified sample selection criteria. One of the Thai companies had to be dropped as it had no sales revenue for the first two years of the sample period. This resulted in a final sample of 15 companies for Malaysia and 20 for Thailand.[3]

Firms were analysed over five-year periods, between 1988 and 1996. In keeping with convention, and as depicted in Figure 1, the two years of distress were dated *t* (the second year of distress) and *t–1* (the first year of distress), the year of normal operations *t–2* and the post-distress years, *t+1* and *t+2*. The database provided an industrial classification for each company. This classification was used to match sample firms with an industry.

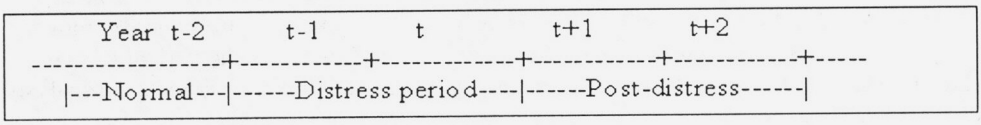

Figure 1: Diagrammatic representation of the five-year period distressed firms were analysed

Table 1: Sample of distressed companies, Malaysia

Malaysia	Financial year end	Sample period	Financial Times industrial classification	Years of interest coverage < 1
Berjuntai Tin Dredging Bhd	30th Apr.	1990-94	Building Materials	4
Best World Land Bhd	30th Jun.	1989-93	Building Materials	4
Construction And Supplies House Bhd	31st Dec.	1992-96	Building Materials	4
Granite Industries Bhd	31st Dec.	1990-94	Distributors	4
Kemayan Corporation Bhd	31st May	1991-95	Construction	2
Malayan Flour Mills Bhd	31st Dec.	1990-94	Food Manufacturers	4
Mni Holdings Bhd	31st Dec.	1991-95	Extractive Industries	4
North Borneo Corporation Bhd, The	31st Dec.	1988-92	Building Materials	4
Psc Industries Bhd	31st Dec.	1991-95	Construction	2
Sanda Industries Bhd	31st Dec.	1992-96	Chemicals	4
Seal Incorporated Bhd	30th Jun.	1992-96	Building Materials	4
Setron, Malaysia Bhd	31st Dec.	1990-94	Electronics & Electrical	4
Sin Heng Chan, Malaya Bhd	31st Dec.	1992-96	Food Manufacturers	3
Spk Sentosa Corporation Bhd	31st Dec.	1992-96	Building Materials	2
Tdm Bhd	31st Dec.	1989-93	Building Materials	2
Average				**3.4**

[3] A few sample firms met the sample selection criteria more than once, especially firms with a long series of financial data. Although the financial reports, which provide the bulk of the data for the analysis, may be available for firms for some early years, other useful general information was available only for more recent years. Because of this, we treated the most recent period, for which a company meets the above sample selection criteria, as the onset of distress.

Table 2: Sample of distressed companies, Thailand

Thailand	Financial year end	Sample period	Industrial classification	Years of interest coverage < 1
Capetronic International, Thailand Public Co Ltd	31st Dec.	1990-93	Electronics & electrical	3
Carnaudmetalbox, Thailand Public Co Ltd	31st Dec.	1992-96	Engineering	2
Earth Industrial Public Co Ltd	31st Dec.	1991-95	Leisure & hotels	4
Eastern Wire Public Co Ltd	31st Dec.	1990-94	Engineering	2
General Engineering Public Co Ltd	31st Dec.	1992-96	Building materials	2
Hantex Public Co Ltd	31st Dec.	1992-96	Household goods & textiles	2
Malee Sampran Factory Public Co Ltd	31st Dec.	1992-96	Food manufacturers	3
Monterey Asia Public Co Ltd	30th April	1992-96	Chemicals	3
Nep Realty And Industry Public Co Ltd	31st Dec.	1989-92	Household goods & textiles	2
New Imperial Hotel Public Co Ltd, The	31st Dec.	1992-96	Leisure & hotels	3
Phuket Island Public Co Ltd	31st Dec.	1992-96	Leisure & hotels	4
Semiconductor Ventures International Public Co	31st Dec.	1989-93	Electronics & electrical	4
Siam Agro Industry Pineapple And Others Public Co	31st Dec.	1992-96	Food manufacturers	4
Siam Food Products Public Co Ltd	31st Dec.	1992-95	Building materials	2
Siam United Services Public Co Ltd	31st Dec.	1991-95	Distributors	3
Surat Canning Public Co Ltd	31st Dec.	1992-96	Food manufacturers	4
Thai Durable Textile Public Co Ltd	31st Dec.	1992-96	Household goods & textiles	4
Thai Electronic Industry Public Co Ltd	31st Dec.	1992-96	Electronics & electrical	4
Thai Onono Public Co Ltd	31st Dec.	1992-96	Household goods & textiles	4
Universal Food Public Co Ltd	31st Dec.	1991-95	Food manufacturers	3
Average				**3.1**

The companies selected from the two countries are listed in Tables 1 and 2. As these tables show, over the five-year period, distressed companies had, on average, 3 or more years of interest coverage shortfall, which means that distressed firms had interest coverage shortfall in 3 of the 4 years after *t*–2. Ten of the fifteen Malaysian firms had interest coverage shortfall for all four years, and for Thailand, the equivalent figure was eight of the twenty firms. These ratios indicate the degree of distress faced by sample firms in the two countries.

3. Corporate Performance Before, During and After Distress

To provide background for the remainder of the analysis, this section analyses operating and financial characteristics of sample firms before, during and after becoming distressed. Table

Table 3: Distressed firms' summary statistics for period *t–2*

	Malaysia					Thailand				
	Mean	Std dev	Median	Min	Max	Mean	Std dev	Median	Min	Max
Market value (US$ million)	35.65 *	20.71	30.04	11.20	88.07	58.08	53.07	42.77	7.30	242.95
Total assets (US$ million)	39.32	22.69	32.51	10.01	82.26	47.08	51.05	33.26	7.63	243.62
Sales revenue (US$ million)	23.38	27.92	9.60	2.07	86.03	34.87	25.81	21.20	5.51	102.53
Total liabilities to market value	0.30	0.18	0.22	0.05	0.63	0.31	0.15	0.30	0.02	0.57
Total liabilities to total assets	0.39 **	0.19	0.36	0.04	0.78	0.53	0.20	0.58	0.11	0.79
Interest coverage (a)	19.97	55.87	2.62	1.01	212.72	3.77	4.14	2.07	1.01	17.95
Interest coverage (b)	30.49	86.34	5.16	1.87	329.31	5.03	5.04	2.91	1.07	21.66
Interest expense to total assets	0.02 ***	0.01	0.01	0.00	0.04	0.03	0.02	0.03	0.00	0.10
Current ratio	1.74	1.59	1.38	0.26	6.71	1.36	1.19	1.19	0.10	5.97
Profit margin	0.13	0.19	0.08	-0.22	0.56	0.11	0.08	0.09	0.02	0.40
Asset turnover	3.38 *	3.12	2.81	0.31	9.92	1.68	2.51	1.04	0.22	11.69
Return on equity (Book value)	0.02 ***	0.04	0.01	-0.03	0.14	0.09	0.08	0.08	0.00	0.34
Return on equity (Market value)	0.01 **	0.02	0.01	-0.01	0.05	0.03	0.03	0.03	0.00	0.12
Proportion firms paying dividends	0.67	0.49	1.00	0.00	1.00	0.60	0.50	1.00	0.00	1.00
Payout ratio	0.60	0.47	0.55	0.05	1.31	2.25	3.86	0.81	0.51	13.41

Market value is the sum of book value of total liabilities and the market value of equity. Interest coverage (a) is defined as profit before interest and tax (PBIT) divided by interest expense, and interest coverage (b) is profit before interest, taxes, depreciation and amortisation divided by interest expense. Interest expense includes interest capitalised. Current ratio is current assets divided by the sum of short-term debt and creditors. Profit margin is PBIT divided by sales. Output to capital-rating is sales divided by net assets (total assets less creditors). Return on equity is profit after tax (PAT) divided by book or market value of equity. If a company pays dividend in *t–2,* it is given a dummy = 1, if it has not paid any dividend, dummy = 0. Hence, the proportion of companies paying dividends is the mean of the 1's and 0's for each sample. The payout ratio is dividend divided by positive PAT. The asterisks represent significance levels for an independent sample t-test (assuming unequal variance) of the means of both samples. They are to be interpreted as *** significant at the 0.01 level, ** significant at the 0.05 level, and * significant at the 0.10 level.

3 reports summary statistics for sample firms at *t–2*, that is, before the companies became distressed. As the table shows, the firms are large, ranging in size of total assets from USD7 million to USD243 million. All but one company has positive operating income and sufficient liquid resources to cover current obligations. However, the average Thai distressed firm with a debt ratio of 58 per cent is significantly more indebted than its Malaysian counterpart with 36 per cent debt.[4] Although Malaysian firms generate higher sales per unit of asset, Thai firms are more profitable. Finally, the dividend payout ratio in both countries averages over 60 per cent. These ratios do not appear abnormal for Malaysian and Thai firms and therefore suggest that *t–2* may have been a normal year of operation for distressed firms in the two countries.

Table 4 presents interest coverage, profit margins, asset turnover, debt and current ratios for sample firms for the five-year period. Apart from showing how distressed firms perform relative to the median firm in their industry,[5] the table also shows how their performance changes over time. For comparison over time, we use *t–2* as the base year.[6] To evaluate whether changes are statistically significant, we used the Wilcoxon test. This test is a non-parametric procedure used with two related samples[7] to test the hypothesis that two variables have the same distribution.[8] Essentially, what we do is compare each variable in the four subsequent years against itself in *t–2*, the year we consider a normal year of operations for distressed firms.

With an exception to the output-sales ratio, all the other performance variables for distressed firms reported in the table worsen over time and when compared with their industry peers. The output-capital ratio is the only positive ratio. Even so, downsizing, especially among Malaysian firms may have buoyed this. For instance, Malaysian-distressed firms' equity to total asset fell from 56.4 per cent in *t–2* to 28.0 per cent by *t+2*, which may be due partly to the operating losses these firms sustained during the period.[9] Although accumulated losses may have also undermined Thai distressed firms asset base, they have not suffered as much; while their equity fell initially from 47.0 per cent in *t–2*, new injections of equity took this back to a comfortable 37.0 per cent by *t+2*.

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4 Note that there is no significant difference between the leverage ratios of Malaysian and Thai firms at market value.

5 As mentioned above, the remaining firms in each industry have been used to construct industry benchmarks. There are at least four companies in each of these industries. Each distressed firm is associated with an industry and industry median ratios for the characteristics reported in Table 5 have been calculated for the respective five-year period over which the distressed firm is analysed. We then simply find the median of these industry medians for each of the characteristics in the table. This is what we mean by industry median.

6 As we mentioned in the previous section, *t-2* appears to be a normal year of operation. Hence we believe that comparison with this year may provide some insight into changes which have taken place and whether these changes can reasonably be attributed to financial distress following *t-2*.

7 The samples in this study are related in the sense that attributes for the same company are compared over time. Hence for each variable, the following matched pairs on each firm are compared: *t-2* and *t-1*, *t-2* and *t*, *t-2* and *t+1*, *t-2* and *t+2*.

8 The Wilcoxon test does not require any assumptions about the nature of the distribution of the two variables because no inference is made about the population from which these companies are selected. The test takes into account information about the magnitude of differences within pairs (annual observations for each company) and applies higher weights to pairs that show large differences than those with small differences. The test statistic is based on the ranks of the absolute values of the differences between the two variables. We use medians for this comparison.

9 Dividend payments, which continued even though Malaysian-distressed firms were not profitable, may also have accounted for part of the decline in shareholders' capital.

Table 4: Distressed firms' financial and operating ratios with industry comparison

Period	Interest coverage			Current ratio		Profit margin			Asset turnover		Debt to total assets	
	Sample firms' median	Industry median	Fraction sample firms' negative	Sample firms' median	Industry median	Sample firms' median	Median industry adjusted negative	Fraction industry adjusted	Sample firms' median	Median industry adjusted	Sample firms	Industry median
Malaysia = 15 companies												
t–2	2.62	10.34	0.00	1.38	1.45	0.08	-0.04	0.87	2.81	0.72	0.36	0.21
t–1	-1.23***	8.79	0.73	0.97***	1.45	-0.04***	-0.21***	1.00	1.57	0.5	0.48***	0.25
t	-1.36***	9.79	0.60	0.79***	1.45	-0.03***	-0.19**	1.00	2.17	0.43	0.52***	0.30
t+1	0.82***	10.90	0.47	0.67***	1.43	0.02**	-0.17*	0.87	1.86	0.58	0.58***	0.30
t+2	-0.31***	9.66	0.53	0.82**	1.44	-0.01***	-0.18**	0.80	1.61	0.48	0.58***	0.37
Thailand = 20 companies												
t–2	2.07	5.17	0.00	1.19	1.10	0.09	-0.04	0.80	1.04	0.17	0.58	0.51
t–1	-0.23***	4.44	0.65	0.88**	1.08	-0.01***	-0.17***	1.00	1.22	0.16	0.59*	0.49
t	-1.02***	4.03	0.85	0.74***	1.15	-0.05***	-0.19***	1.00	1.26	0.19	0.65***	0.48
t+1	-0.09***	3.46	0.50	0.83***	1.13	0.00***	-0.11***	0.90	1.41	0.07	0.70**	0.53
t+2	1.08***	2.74	0.30	1.00**	1.12	0.05**	-0.07	0.75	1.69*	0.36	0.59	0.55

The ratios are as defined in the previous table. Industry adjusted ratios are firm ratios minus industry medians. The asterisks represent significance levels for the Wilcoxon test for related samples. The asterisks are to be interpreted as: *** significant at the 0.01 level, ** significant at the 0.05 level, * significant at the 0.10 level.

Downsizing by Malaysian firms may also have made their gearing ratio look much worse than normal, since the proceeds from asset sales were not used to discharge debt. Consequently, the average debt ratio increased from 48 per cent in *t–2* to over 130 per cent by *t+1*. On the other hand, Thai distressed firms continued to borrow, even though they already had high levels of debt. Hence, gearing for these firms increased from 130 per cent in *t–2*, to over 230 per cent by *t+1*.

4. Regression Analysis

Against this background, the remainder of this study investigates the relationship between a firm's financial structure and the costs incurred when it becomes financially distressed. The objective is to determine whether differences in the financial structure of firms in Malaysia and Thailand are associated with significant variations in the investment spending and sales performance of these firms *after* they become financially distressed. We employed multivariate regression techniques to explain these variations, controlling for a number of factors that might help to explain them. Although the analysis focuses on the distressed sample, to ensure that the relationships that we capture are due to financial distress, we replicated the analysis on a pooled sample of distressed and non-distressed firms, using dummies to pick up the differences.

4.1 Dependent Variables

The two dependent variables used to capture the cost of financial distress are investment spending and sales growth. Firms which are experiencing internal cash flow problems may be forced to cut back on their investment spending, if they are also experiencing problems raising external finance. When cash is plentiful, firms may invest, even when the investment is inefficient, since new investment raises the option value of shareholders equity (Jensen and Meckling 1976). However, when investment finance is in short supply, firms may have to be more selective about which projects they undertake. Cash flow problems during financial distress may also retard the firm's competitiveness in the product market for various reasons: creditors may be unwilling to extend credit to them fearing that they may go bankrupt before clearing their debts; distressed firms may be unable to take advantage of cash discounts; and customers may be reluctant to buy durable goods from weak firms, which might not be in business to provide after sales service.

Total investment is calculated as the sum of the capital stock of depreciable assets or the net book value of total fixed assets at year end (KNB_{t+1}), plus depreciation and amortisation (DEP_t) and the value of investment in subsidiaries and associated companies for the year, less the net book value of total assets at the beginning of the year (KNB_t). This is normalised by KNB_t. Total investment is therefore measured as a flow from one year to the next. Sales growth is calculated in a similar way as the difference in net sales in year *t* and *t+1*, normalised by net sales in year *t*.

The dependent variables are cumulated over the post-distress period or alternatively over the last two years of the sample period. Testing the impact of differences in financial structure on firm behaviour in the post-distress period should help us detect if any differences exist, since these factors are likely to be magnified during periods of financial distress.

4.2 Independent Variables

4.2.1 Financial Structure Proxies

The main independent variables are the financial structure proxies. Previous studies have shown that in Thailand and other countries such as Japan and Korea where banks and industry maintain close ties, bank loans account for a large proportion of corporate investment. In market-based countries, such as the UK and Malaysia, bank-firm relationships are not as strong, neither do banks finance as much of corporate investment in these countries as they do in the former group of countries. Malaysian firms rely heavily on internal sources to finance their investments.[10]

The proportion of bank loans in corporate investment should therefore provide some indication of the nature of the financial structures in Malaysia and Thailand. A variable to capture these effects could be constructed in two ways: bank loans can be divided by total book value or market value capital, or by total corporate debt. In a study of bank-firm relationships and corporate profitability in Germany, Cable (1985) used the ratio normalised by corporate debt as one of his proxies to capture lending relationships, especially as regards to the type and amount of information acquired by banks in their relationship with their clients. He argues that this proxy is less prone to simultaneity bias than bank loans to total capital, since if high profitability generates a feedback to borrowing via increased credit-worthiness, this is more likely to affect total borrowing than it would the composition of a given level of debt. However, he also points out that regressions, which include bank loans to total capital, give results very similar to those of his preferred proxy.

In this study, we used bank loans to total capital as one of our main proxies for financial structure. Although the size of loans granted by banks should capture the type and amount of information banks acquire, in order to use bank loans as a proxy to show differences in the financial structures of firms in a cross-country study, bank loans (the numerator) must be normalised by an appropriate and comparable denominator. If we use total corporate debt as the denominator, as Cable (1985) does, then Malaysian firms, which, in general, are less indebted and have less bank loans, can end up with the same bank loans to total corporate debt *ratio* as an highly indebted Thai firm, with large amounts of bank finance.[11] To avoid this, we used total capital as the denominator. In fact, we constructed two variables, one normalised by book value and the other by market value capital.[12]

One could argue that these proxies might not capture the true aspects of the industrial systems of finance in a country, especially with respect to the nature of bank-firm relationships. For instance, although Cable (1985) and others argue that German banks maintain close relationships with their clients, Corbett and Jenkinson (1994), for example, found that the proportion of bank loans in corporate finance in Germany is relatively small, and on average, is not much different from that in the US. Given that Cable (1985) and Allen and Gale (1995)

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[10] See, for example, Corbett and Jenkinson (1994), Chensavasdijai (1996), Singh (1995) and Matthias (1999).

[11] The reason is that both the numerator and denominator in Malaysia are likely to be small, whereas both of these variables are likely to be large in Thailand.

[12] As we do not have data on the market value of debt, market value here is the sum of the market value of equity and the book value of debt.

among others classify Germany as a bank-based system, our proxy may not fully reflect the role of banks in Germany. However, in Malaysia and Thailand, the situation is a bit more straightforward: Thai firms make heavy use of bank loans and tend to have close links with banks, whereas Malaysian firms, in general, neither have close ties with banks, nor use bank loans on the scale used in Thailand. This should help to simplify the interpretation that we place on the financial structure proxies.

Total debt is the other main financial structure variable. Since total debt accounts for all creditors, it is determined by a number of factors. For example, the difference between the loans and debt variables may provide information about access to short term trade credit. The debt measure is also useful as it allows for comparison of our results with those from other studies, which use total debt as their proxy for financial factors. Two measures of debt are used: one normalised by book value capital and the other by market value capital.

Financial structure proxies are measured at *t* with a one-year lag. This lag reduces problems of endogeneity between current leverage, profitability and investment: firms with high leverage tend to be more profitable (Titman and Wessels 1988), and highly profitable firms tend to invest more. This implies a positive correlation. However, there could also be a spurious negative correlation: poorly performing firms might be required to increase their borrowing to invest in new profitable projects or simply to cover their losses.

One of the problems with these proxies is that we are in effect using leverage to proxy for financial structure and industrial finance systems without accounting for the fact that firms within the same industrial finance system may carry different amounts of leverage, which has little to do with the nature of the systems of industrial finance. Even in Thailand, where firms tend to be highly indebted, there may be high variation in leverage ratios among firms.

Not only at the country level, but within the same industry, firms could also be indifferent between high and low leverage (Maksimovic and Zechner 1991). Furthermore, high leverage could be an indication of the economic vulnerability of firms, which have endured several periods of negative profits.[13] Management preferences may also help determine the amount of leverage firms carry at various points in time. Some firms may have high leverage as a way of committing themselves to a higher growth path (Grossman and Hart 1982) or to signal higher future growth prospects (Ross 1977). Other firms may choose to maintain financial slack for new investment (Myers 1977; Myers and Majluf 1984) or to profit from acquiring the assets of their more highly leveraged competitors, which succumb to industry downturns (Shleifer and Vishny 1992).

However, even if the financial structure proxy measures only the leverage effect, the regression results may still be consistent with differences in information and agency problems in the two countries. For instance, agency costs theories of Jensen (1989) and Stulz (1990) suggest that leverage should be negatively associated with the growth of firms with poor investment prospects known to the market, since these firms must be prevented from investing society's scarce resources in projects of questionable quality.

Conflict among creditors is only one problem when firms become distressed. Information asymmetry also creates difficulties for distressed firms, since available public information may provide only an incomplete picture of the firm's future cash flows. Given the more

[13] We expect the one-year lag on the financial structure proxies to dampen these effects.

highly dispersed holding of debt and equity stakes among Malaysian investors and attendant free-rider problems, Malaysian creditors are unlikely to properly investigate the plight of their troubled firms. This information gap is likely to increase the premium on market finance.

Positive coefficients on the leverage variable in the investment regressions might suggest that leverage does not reduce the growth prospects for all firms, but only for those whose prospects are not known to the market. This argument is supported by Lang *et al.* (1996). Their results show that leverage varies positively with growth for firms whose prospects are known to the market, but negatively for those for whom the market has little information.

4.2.2 Control Variables

We included a number of independent variables to control for several factors. One of these is firm size,[14] measured as the log of sales at the beginning of the sample period. The rationale for inclusion of this variable is that smaller firms may be more easily forced out of business and may be more affected by asymmetric information when they become distressed. We also included the firm's investment and sales growth rate cumulated over the period before which the dependent variable is measured. Ex ante investment and ex ante sales growth should control for trends in these variables. They should show whether firms with higher investments and sales in the early period continue to invest and sell more in the post-distress period. Industry factors were controlled using the median of investment spending and sales growth rates as well as industry dummy variables.

We also included cash flow normalised by interest expense (that is, interest coverage) to control for a number of factors. Interest coverage may proxy for capital structure, since highly leveraged firms should have higher interest costs, and other things constant, lower interest coverage. The sign on this variable could be either positive or negative, depending on how leverage affects investment or sales in each country. Interest coverage also provides a measure of the degree of distress: firms with low interest coverage are less profitable and hence may have fewer opportunities for investment.[15] This implies a positive correlation. Interest coverage is measured at t to minimise the kind of problems of endogeneity discussed above.

4.3 Regression Results

In this section, we tested the main hypothesis that financial structure is associated with shifts in investment and sales when firms become distressed. To do so, we first ran regressions on each of the two samples to gauge the impact of financial structure on cross-sectional variations in investment spending and sales growth within each country. An F-test[16] was applied to the error terms from these regressions to test for poolability of the samples. Using this test, the hypothesis of equality of standard errors from the two different samples was rejected at the 1 percent level for the investment and sales regressions. The standard errors from the Malaysian

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[14] Log sale is used by Opler and Titman (1994) and Hall and Weinstein (1996) to control for size effects.

[15] As the evidence from the international study by Kadapakkam, Kumar and Riddick (1998) suggests, cash flow may also pick up constraints on investment spending. Unfortunately, our simple model cannot test unambiguously for this.

[16] This is given as: $F = (\sigma_1/\sigma_2)^2, (F, df_1, df_2)$, where σ_1^2 and σ_2^2 are standard errors from the first and second sample respectively and df_1, df_2 are the degrees of freedom of the numerator and denominator, respectively.

regressions are about one and a half times as large as those from the Thai regressions. For example, the standard error from the Malaysian sales regression with the debt to total assets proxy was 0.79, whereas that for Thailand was 0.53. In spite of this, we pooled the samples, but calculated robust standard errors for our estimators to control for the heteroscedasticity detected in the data. In the pooled regressions, Thailand is the reference country. The models and results are discussed below.

4.3.1 Investment Regression Results

4.3.1.1 Distressed Sample of Firms

For distressed firms in Malaysia and Thailand, the following model was run separately:

$$y_j = \alpha + \sum_{k=1}^{5} \beta_k x_{kj} + \delta v_j + e_j \qquad (1)$$

where y_j is the dependent variable for firm j; α, β, δ are parameters of the model; $\mathbf{x}$ is a matrix of control variables; $\mathbf{v}$ is the financial structure proxy and e_j is the usual disturbance term with zero mean and homoscedastic variance.

Because the financial structure proxies were highly correlated, we avoided multicollinearity by including only one of these variables in each equation.[17] Hence, for each model we ran four regression equations, which differed only by the type of financial structure proxy included in each equation, that is, the only difference between these four equations was $\mathbf{v}_j$. However, because these individual sample results were used mainly to test for poolability, they are not reported.

$$y_j = \alpha + \alpha_o \lambda_j + \sum_{k=1}^{5} \beta_k \mathbf{x}_{kj} + \sum_{k=1}^{5} \beta_{ok} \lambda_j \mathbf{x}_{kj} + \delta \mathbf{v}_j + \delta \lambda_j \mathbf{v}_j + \mathrm{e}_j \qquad (2)$$

Model 2 is a slight modification of (1). We pooled both samples in Model 2 and introduced a country dummy, $\lambda = 1$, if firm j is a Malaysian firm and zero otherwise. We interacted this dummy with the intercept, control variables and financial structure proxies. Although this formulation is equivalent to running separate regressions on the individual country samples, the results from the pooled sample are more useful as the dummy allows a direct test of the hypothesis, that is, whether there are significant differences in the impact of financial structure on the investment spending and sales performance of distressed firms in the two countries. The focus is therefore on the magnitude, sign and significance of the 5th and 6th terms in Model 2.

The investment regression results from Model 2 are reported in Table 5. These results suggest that there are no significant differences in the average investment spending by distressed firms in the post-distress period in the two countries. As expected, distressed-firms' investment correlates positively with industry investment. However, in both countries, the same firms appear to invest less in the post-distress period. For example, holding the other variables constant, Thai-distressed firms' investment spending fell by between 28 and 30 percentage over $t+1$ to $t+2$, relative to that in $t-2$ to t. Malaysia's case is similar. Reductions

[17] We do not report the correlation matrix, but it is available from the author on request.

Table 5: Total investment and financial structure (pooled distressed sample)

Variable	(1)	(2)	(3)	(4)
Intercept	2.09	0.62	2.85	1.01
	(0.67)	(0.16)	(0.76)	(0.24)
Intercept [Malaysia]	1.22	1.37	0.92	2.61
	(0.35)	(0.32)	(0.23)	(0.59)
Industry cum. investment over *t+1* to *t+2*	5.64	4.95	5.82	5.11
	(1.67)	(1.36)	(1.75)*	(1.35)
Industry cum. Investment over *t+1* to *t+2* [Malaysia]	-2.07	-1.90	-2.34	-2.29
	(-0.60)	(-0.52)	(-0.69)	(-0.60)
Log of sales in *t–2*	-0.94	-0.31	-1.09	-0.48
	(-1.18)	(-0.32)	(-1.09)	(-0.44)
Log of sales in *t–2* [Malaysia]	0.16	-0.10	0.19	-0.33
	(0.18)	(-0.10)	(0.18)	(-0.29)
Cumulative investment in *t–2* to *t*	-0.28	-0.31	-0.28	-0.30
	(-1.33)	(-1.43)	(-1.50)	(-1.43)
Cumulative investment in *t–2* to *t* [Malaysia]	-0.02	0.21	0.06	0.44
	(-0.06)	(0.67)	(0.21)	(1.44)
Interest coverage in *t*	0.23	0.16	0.25	0.17
	(1.49)	(1.02)	(1.58)	(1.01)
Interest coverage in *t* [Malaysia]	0.02	0.08	-0.04	0.00
	(0.12)	(0.43)	(-0.20)	(-0.02)
Sales growth over *t–2* to *t*	-0.23	-0.38	-0.37	-0.41
	(-1.01)	(-1.09)	(-1.49)	(-1.26)
Sales growth over *t–2* to *t* [Malaysia]	-0.37	0.07	-0.37	-0.16
	(-1.12)	(0.17)	(-1.05)	(-0.42)
Debt to total assets in *t*	1.40			
	(3.04)***			
Debt to total assets in *t* [Malaysia]	-2.47			
	(-2.17)**			
Debt to market value in *t*		-0.09		
		(-0.07)		
Debt to market value in *t* [Malaysia]		-2.73		
		(-1.57)		
Loans to total assets in *t*			1.76	
			(2.26)**	
Loans to total assets in *t* [Malaysia]			-3.83	
			(-2.21)**	
Loans to market value in *t*				0.70
				(0.48)
Loans to market value in *t* [Malaysia]				-7.46
				(-2.55)**
Adjusted R-squared	0.41	0.27	0.44	0.31
Probability (F-statistic)	0.02	0.08	0.01	0.05
No of observations	35	35	35	35

*** Indicates significance at the 0.01 level; ** significance at the 0.05 level; and * significance at the 0.10 level

OLS regression results for control and financial structure variables are used to explain total investment cumulated over *t+1* to *t+2*. White's heteroskedastic-consistent standard errors are reported and t-statistics appear in parentheses.

ranged from 10 to 30 per cent, although in Equation 4, with debt to market capital as the proxy, investment spending increased by 14 per cent over *t+1* to *t+2*.

The results also suggest that firms with higher sales in *t-2* to *t* invested less in *t+1* to *t+2*. Perhaps distressed firms have been losing market share and have therefore been downsizing. This might explain why the impact was so much greater in Malaysia. A Malaysian-distressed firm with 10 per cent higher sales in *t–2* to *t* has between 30 and 75 per cent lower investment in *t+1* to *t+2*, other things being constant. The size of this effect can be explained only by a concerted restructuring and reorganisation effort. Although Thai-distressed firms also cut back on investment when sales fell-off, this was not as far reaching as the 23 to 41 per cent cut back by their Malaysian peers.

Size also correlates negatively with investment in the post-distress period. This is consistent with the negative size-growth relationship found by Singh and Whittington (1968). The results suggests that the largest firms in both countries are those which make the largest cut back in investment spending after the onset of distress.

Interest coverage during distress is positively associated with distressed firms' investment spending in the post-distress period. However, because interest coverage could proxy for a number of things, it is difficult to say exactly what this result means. If interest coverage proxies for the degree of distress, it could be that profitable firms invest more as they have better investment prospects. If it proxies for leverage, the results could also indicate that firms have been accumulating financial slack to undertake future investment. If, on the other hand, interest coverage proxies for cash flow, it might indicate that firms are experiencing cashflow constraints.

The financial structure estimates are, however, our main concern in these regressions. Equations 1[18] and 3 show a significant positive relationship between financial structure and investment in Thailand. In Malaysia, the relationship is negative. Since we are effectively using leverage to proxy for the financial structure of companies in the two countries, the absolute size of the coefficient is less important than its sign, especially since we cannot be certain whether the attributes are accurately measured. The estimates suggest that, unlike Thai-distressed firms, the financial structure of Malaysian-distressed firms has a negative impact on their post-distress investment spending. The estimate in Equation 1 implies that, all other variables held constant, a 10 per cent increase in the debt to assets ratio of Thai-distressed firms led to a 140 per cent increase in investment spending over *t+1* to *t+2*. In contrast, a similar 10 per cent *increase* for their Malaysian peers, is associated with a decrease of 107 per cent in investment spending.

These results suggest that a higher fraction of debt or bank borrowing in a firm's total capital is associated with significantly higher levels of investment by Thai-distressed firms than their Malaysian counterparts. These results are consistent with our *a priori* expectations. However, because we were analysing distressed firms, we are hesitant to draw too many inferences about the populations of firms from which these come. The small size of the sample is one reason for this reluctance. Another reason is that it could be that financial structure has a similar effect on the investment spending of distressed and non-distressed firms alike in Malaysia and Thailand. If this is true, then our results may have little to do with financial distress and perhaps more to do with the differential impact of financial factors on firms' investment spending in general.

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[18] To save space, these results are not presented, but are available from the author on request.

4.3.1.2 Full Sample of Distressed and Non-distressed Firms

To check whether this is the case, we replicated the study on a larger sample of firms, referred to in this study as the *full* sample.[19] The *full* sample consisted of both distressed and non-distressed non-financial firms available in Extel. The only selection criterion imposed on the sample selection process was that firms should have at least five years of data. After deletions for missing values, we found a sample of 237 Malaysian and 186 Thai-distressed and non-distressed firms from a total of 578 Malaysian and 344 Thai non-financial firms. A number of firms were excluded as they had missing share price data for part of the sample period, 1992 to 1996.

The variables constructed for the full sample were similar to those for the distressed sample. The dependent variable was still total investment cumulated over the last two years of the sample period, which in this case was 1995 to 1996. The independent variables were also comparable and were measured with a similar time lag. As done for the distressed sample, Model 3 was estimated for the full sample for each country, using the results to test for poolability:

$$y_j = \alpha + \sum_{k=1}^{4} \beta_k \mathbf{x}_{kj} + \delta\gamma_j \mathbf{v}_j + \sum_{n=1}^{11} \rho_n \eta_{nj} + e_j \qquad (3)$$

There are two major differences between Models (1) and (3). In Model 3, we included an interaction term, the product of the financial structure variable and a distress dummy $\gamma = 1$ if firm j has an interest coverage of less than 1 in 1994. Model 3 also includes 4 control variables instead of the 5 used in Model 1. Furthermore, in Model 3, we controlled for industry using a set of industry dummies, η_n, $n = 1, 2, \ldots 11$, omitting one industry (Building Materials) in each country.[20] For the *full* pooled sample, we therefore estimated Model 4 to be

$$y_j = \alpha + \alpha_o \lambda_j + \sum_{k=1}^{4} \beta_k \mathbf{x}_{kj} + \sum_{k=1}^{4} \beta_{ok} \lambda_j \mathbf{x}_{kj} + \delta v_j + \delta_o \lambda_j \mathbf{v}_j + \delta_1 \lambda_j \gamma_j \mathbf{v}_j + \sum_{n=1}^{11} \rho_n \eta_{nj} + \sum_{n=1}^{11} \rho_{on} \lambda_j \eta_{nj} + e_j \qquad (4)$$

[19] Before using the full sample, we also tried to extend the sample of distressed firms to test the robustness of our results. In order to extend the sample size, we had to use less restrictive selection criteria than those used in selecting the original samples of distressed firms. Hence, we define firms in financial distress as (1) those which have an interest coverage ratio of 0.80 or less in one year, (2) those with an interest coverage ratio exceeding 1 in the year immediately preceding the year of interest coverage shortfall and (3) those with at least one year of data after the distress year. Using these criteria, we found 40 Malaysian and 43 Thai firms. Although these samples are slightly bigger than our original samples of distressed firms, these firms are, on average, arguably less severely distressed. Since we could only extend the sample by limiting the period of coverage, the analysis was done over a shorter period of time. Perhaps, these two factors might account for why we did not find any significant results. We used Model 2 above with similar dependent, control and financial structure variables as used in the original samples regression. However, although the coefficients on the financial structure variables for Malaysia and Thailand were consistently negative, none was significant.

[20] We controlled for industry using dummies because we included in the full sample, all companies with a full set of data.

Model 4 is different from Model 3 in that each of the terms in Model 3 is now interacted with a country dummy, $\lambda = 1$ if firm j is Malaysian and zero otherwise. Model 4 therefore allows us to separate the differential impact of financial structure on the investment spending of distressed and non-distressed firms, as well as to show how these effects vary across country.[21] In this study, we are particularly interested in the 5th to 8th terms of Model 4.

The results from Model 4 are reported in Table 6. Although we included dummies to account for industry effects, we have not reported these coefficients. The estimates for the control variables were of different magnitudes. However, in most cases, the signs on these variables were similar to those from the distressed sample with the exception of ex ante sales. While the coefficients on the sales variable were large and negative in the distressed sample. On the other hand, in the full sample, they were positive. This positive sign is consistent with a sales accelerator effect: higher sales lead to increased investment. In Thailand, for example, a 10 per cent increase in sales is associated with between 2 to 8 per cent increase in investment spending, while in Malaysia, a similar increase generates between 6 to 12 per cent higher investment.

The coefficients on the financial structure proxies also provide strong support for the results from the distressed sample. As Table 6 shows, financial factors have a significantly negative impact on the investment spending of Malaysian-distressed firms. In these regressions, the differential coefficients on the Malaysian distressed firms were negative and large in absolute terms. For instance, in Equations 1 and 3, where the proxy was normalised by total assets, the point estimates were -0.26 and -0.82. In Equations 2 and 4, where the proxy is normalised by market value, the estimates were -2.55 and -3.47. Regardless, of how financial structure is modelled, the impact on the investment spending of Malaysian distressed firms was negative.

In contrast, the differential coefficients for Thai-distressed firms' were either large positive or only slightly negative. When the proxy was normalised by book value assets, the point estimates were 0.94 and 0.87 (Equations 1 and 3). However, where the proxy was normalised by market capital, the point estimates were -0.72 and -0.54 (Equations 2 and 4). Compared with Malaysia, financial structure seems to have a far more positive impact or at least a far less negative influence on the investment spending of Thai-distressed firms, irrespective of the proxy considered.

It is likely, however, that the proxies normalised by market value were negatively biased. This bias could result because market values incorporate expectations about the firm's future growth prospects and therefore induce a negative relation between investment and the market value of the firm. Firms without good investment prospects are likely to have a low market value and a correspondingly large bank loans or total debt to market value ratio. In contrast, firms with good prospects may have a higher market value and a smaller ratio. Both cases imply a spurious negative correlation. Although book value capital does not totally eliminate this bias, it is much less severe since book value capital does not usually reflect recent market valuation changes.

Our results are also able to show that financial structure does not have a negative impact on the investment spending of all firms. Table 6 shows that the coefficient on the financial structure proxy for non-distressed Malaysian firms is positive in all four equations. This is

[21] There are, of course, several ways of introducing dummy variables. For example, we could have easily omitted the 8th term of Model 4, but the interpretation of the remaining variables would naturally have been different.

Table 6: Total investment and financial structure (full pooled sample)

Variable / Regression Equation	(1)	(2)	(3)	(4)
Intercept	0.13	0.63	0.18	0.58
	(0.36)	(2.05)**	(0.53)	(1.92)*
Intercept [Malaysia]	1.07	0.49	0.85	0.48
	(1.36)	(0.67)	(1.10)	(0.67)
Log of sales in 1992	-0.03	0.06	0.00	0.05
	(-0.45)	(0.86)	(0.01)	(0.62)
Log of sales in 1992 [Malaysia]	-0.14	-0.12	-0.07	-0.09
	(-0.88)	(-0.72)	(-0.48)	(-0.62)
Investment over 1992-94	-0.13	-0.14	-0.13	-0.13
	(-1.59)	(-1.76)*	(-1.70)*	(-1.64)*
Investment over 1993-94 [Malaysia]	0.03	0.08	0.05	0.07
	(0.20)	(0.59)	(0.41)	(0.53)
Sales growth over 1993-94	0.02	0.08	0.03	0.07
	(0.34)	(1.68)*	(0.56)	(1.35)
Sales growth over 1993-94 [Malaysia]	0.04	0.03	0.07	0.05
	(0.33)	(0.22)	(0.53)	(0.34)
Interest coverage in 1994	0.08	-0.01	0.07	-0.01
	(2.93)***	(-0.44)	(2.85)***	(-0.24)
Interest coverage in 1994 [Malaysia]	-0.11	-0.04	-0.10	-0.03
	(-1.42)	(-0.54)	(-1.36)	(-0.50)
Debt to total assets in 1994	0.65			
	(2.73)***			
Debt to total assets in 1994 [Malaysia]	0.49			
	(0.93)			
Debt to total assets in 1994 x distress dummy	0.29			
	(1.05)			
Debt to total assets in 1994 x distress dummy [Malaysia]	-1.40			
	(-2.00)**			
Debt to market value in 1994		-0.66		
		(-2.36)**		
Debt to market value in 1994 [Malaysia]		0.93		
		(1.36)		
Debt to market value in 1994 x distress dummy		-0.06		
		(-0.19)		
Debt to market value in 1994 x distress dummy [Malaysia]		-2.82		
		(-2.45)***		
Loans to total assets in 1994			0.50	
			(2.03)**	
Loans to total assets in 1994 [Malaysia]			0.23	
			(0.38)	
Loans to total assets in 1994 x distress dummy			0.37	
			(1.10)	
Loans to total assets in 1994 x distress dummy [Malaysia]			-1.55	
			(-1.58)	
Loans to market value in 1994				-0.51
				(-1.49)
Loans to market value in 1994 [Malaysia]				1.00
				(1.02)
Loans to market value in 1994 x distress dummy				-0.03
				(-0.08)
Loans to market value in 1994 x distress dummy [Malaysia]				-3.96
				(-2.59)***
Adjusted R-squared	0.09	0.06	0.07	0.06
Probability (F-statistic)	0.00	0.01	0.00	0.01
No. of observations	401	401	401	401

*** Indicates significance at the 0.01 level; ** Indicates significance at the 0.05 level;
* Indicates significance at the 0.10 level.
OLS regression results for control and financial structure variables used to explain total investment over 1995 & 1996. Industry dummies have been included in the regressions but are not reported. White's heteroskedastic-consistent standard errors are reported and t-statistics appear in parentheses.

also the case for Thai-distressed and non-distressed firms in equations where proxies were normalised by book value assets. However, normalised at market value, the Thai proxies turned negative. Still, only for Malaysian distressed firms does financial structure correlate negatively with investment spending in all four regressions. The findings from the full pooled sample are consistent with those from the distressed sample discussed above.

4.3.2 Sales Regression Results

To evaluate the impact of financial structure on the sales performance of distressed firms, we repeated the analysis, this time using sales as the dependent variable. The control and financial structure variables in the sales regressions were identical to those used in the investment regressions. In fact, apart from the dependent variables, there was only one other major change in the model: while in the investment regressions we included *ex ante* sales to control for accelerator effects, we substituted this variable in the sales regressions with *ex ante* investment. Secondly, we omited *ex ante* sales from the sales regressions for the distressed sample as it does not have any incremental explanatory power and also because we want to run a parsimonious model given the small sample size.[22] But we reintroduced this variable in Model 4, with the larger sample.

4.3.2.1 Full Sample of Distressed and Non-distressed Firms

The results from the *full* pooled sample regressions are reported in Table 7. They suggest that size is negatively correlated with sales in both countries, but the magnitude is seven times as large in Malaysia. Similarly, firms with high sales growth rates in the early period (1993 to 1994), expanded more slowly in the later period (1995 and 1996). For instance, firms with 10 per cent higher sales growth in the early period experienced between 4 to 7 per cent decline in their rates of expansion.

Investment spending in the early period is positively related to sales in the post distress period. This has been the case particularly for Malaysian firms. For every 10 per cent investment in capital stock, Malaysian firms generated a corresponding 10 per cent increase in sales, whereas in Thailand, sales increased by, at most, 2 per cent with a similar rate of investment.

If interest coverage proxies for the degree of distress or profitability, then less distressed Malaysian firms sold more in the first period than in the second period. The opposite is true in Thailand. A 10 per cent increase in the interest coverage ratio was associated with between 4 and 6 per cent higher sales by Malaysian firms, but in Thailand, a similar increase is associated with between 9 and 12 per cent decline in sales. If, however, interest coverage proxies for leverage,[23] the results suggest that highly leveraged Thai firms raise their market shares much faster than their highly leveraged Malaysian peers.

The financial structure proxies suggest that higher levels of debt are associated with lower rates of sales in Thailand, but in Malaysia, this relationship was positive in all cases. The results suggest that more highly indebted Thai firms expanded at a much slower rate than

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[22] The t-value of *ex-ante* sales was less than 1 in our regressions: adjusted R^2 increases only when the t-value of the coefficient of a new variable is larger than 1 in absolute terms.

[23] Highly leveraged firms should incur higher interest costs and therefore have lower interest coverage ratios, other things held constant.

Table 7: Sales and financial structure (full pooled sample)

Variable / Regression equation	(1)	(2)	(3)	(4)
Intercept	1.04	1.11	1.13	1.21
	(2.39)**	(2.57)***	(2.67)***	(2.71)***
Intercept [Malaysia]	1.32	1.12	1.10	1.00
	(1.74)**	(1.47)	(1.46)	(1.29)
Log of sales in 1992	-0.07	-0.05	-0.04	-0.06
	(-0.87)	(-0.66)	(-0.56)	(-0.70)
Log of sales in 1992 [Malaysia]	-0.36	-0.35	-0.38	-0.36
	(-2.42)**	(-2.29)**	(-2.56)***	(-2.43)**
Sales growth over 1993-94	-0.10	-0.07	-0.08	-0.06
	(-1.24)	(-1.07)	(-1.07)	(-1.01)
Sales growth over 1993-94 [Malaysia]	0.06	0.05	0.05	0.04
	(0.48)	(0.39)	(0.36)	(0.32)
Investment over 1993-94	0.01	0.01	0.02	0.01
	(0.21)	(0.16)	(0.24)	(0.20)
Investment over 1993-94 [Malaysia]	0.09	0.10	0.08	0.10
	(0.81)	(0.99)	(0.79)	(0.92)
Interest coverage in 1994	-0.09	-0.10	-0.12	-0.11
	(-2.34)**	(-1.90)*	(-2.49)***	(-2.14)**
Interest coverage in 1994 [Malaysia]	0.13	0.15	0.17	0.18
	(2.18)**	(1.96)**	(2.70)***	(2.36)**
Debt to total assets in 1994	0.05			
	(0.15)			
Debt to total assets in 1994 [Malaysia]	0.27			
	(0.51)			
Debt to total assets in 1994 x distress dummy	-0.76			
	(-2.54)***			
Debt to total assets in 1994 x distress dummy [Malaysia]	0.14			
	(0.26)			
Debt to market value in 1994		-0.30		
		(-0.93)		
Debt to market value in 1994 [Malaysia]		0.47		
		(0.86)		
Debt to market value in 1994 x distress dummy		-1.01		
		(-3.52)***		
Debt to market value in 1994 x distress dummy [Malaysia]		0.10		
		(0.10)		
Loans to total assets in 1994			-0.25	
			(-0.75)	
Loans to total assets in 1994 [Malaysia]			0.76	
			(1.50)	
Loans to total assets in 1994 x distress dummy			-1.06	
			(-3.42)***	
Loans to total assets in 1994 x distress dummy [Malaysia]			0.25	
			(0.33)	
Loans to market value in 1994				-0.53
				(-1.31)
Loans to market value in 1994 [Malaysia]				1.10
				(1.64)*
Loans to market value in 1994 x distress dummy				-1.45
				(-3.29)***
Loans to market value in 1994 x distress dummy [Malaysia]				0.49
				(0.41)
Adjusted R-squared	0.16	0.16	0.18	0.17
Probability (F-statistic)	0.00	0.00	0.00	0.00
No. of observations	402	402	402	402

*** Indicates significance at the 0.01 level; ** significance at the 0.05 level; * Indicates significance at the 0.10 level. OLS regression results for control and financial structure variables used to explain sales growth over 1995 & 1996. Industry dummies have been included in the regressions but are not reported. Whiteís heteroskedastic-consistent standard errors are reported and t-statistics appear in parentheses.

their less distressed peers. In essence, firms that attracted large amounts of finance did not used these funds efficiently. Although this appears to be the case for all Thai firms, when these firms become distressed, they become even less efficient.

For example, a 10 per cent increase in the debt to assets of a non-distressed Thai firm was associated with a 5 per cent increase in the sales growth rate. However, if the firm was distressed, its sales growth rate fell by 76 per cent (Equation 1). In contrast, a non-distressed Malaysian firm increased its sales growth rate by over 30 per cent, while its distressed peers hiked theirs by 46 per cent, for a similar 10 per cent increase in debt.

These results suggest that financial structure has the opposite effect on sales and investment performance on distressed firms in the two countries. Whereas a higher fraction of debt in the capital structure of Malaysian distressed firms lowered their investment spending, it raised their sales performance. For Thai distressed and non-distressed firms, the opposite is true. This suggests that while Thai firms continue to build their asset base without increasing sales, Malaysian firms have been forced to downsize, and raise their output-capital ratios and overall efficiency.

These findings support our earlier argument that Thai firms may have been over-investing in the years before distress, and this may have been one of the reasons why there was a significant drop in investment spending when these firms became distressed and internal resources became limited. Although Thai firms continued to invest, Malaysian-distressed firms appear to have restructured their operations. This restructuring appears likely to have created leaner and more efficient firms.

4.3.2.2 Distressed Sample of Firms

Although the estimates for many of the control variables are consistent with our results from the full pooled sample, the coefficients on the financial structure proxies in the distressed sample (Table 8) do not give consistent results. The signs on these coefficients change from one regression to the next. If these results are to be believed, financial structure has a similar effect on the sales performance of distressed-firms in the two countries. The small number of degrees of freedom is perhaps one of the factors which accounts for the inconsistency of the signs on the coefficients in these regressions.

5. Conclusion

Despite the negative bias on the market value proxies, the results provide some indication of the impact of financial structure on distressed firms' investment and sales performance in Malaysia and Thailand. Since we were using leverage to proxy for financial structures in Malaysia and Thailand, it is not the magnitude of the coefficients on leverage that is important, but rather the sign on these coefficients. In the investment regressions, these signs suggest that a higher fraction of loans or debt which provides some indication of the strength of bank ties or the information provided to banks is positively associated with higher investment by Thai–distressed firms, but lower investment by Malaysian-distressed firms. Interestingly, the finding is exactly the other way round for the sales regressions.

The positive association between Thai-distressed firms' investment and their financial structure can be explained by their close ties to banks and consequently the apparently easy access to additional credit when the internal resources become scarce. Equity of Thai banks

Table 8: Sales and financial structure (pooled distressed sample)

Variable / Regression Equation	(1)	(2)	(3)	(4)
Intercept	2.74	3.07	3.08	3.43
	(1.55)	(1.48)	(1.77)*	(1.70)*
Intercept [Malaysia]	-5.30	-5.20	-5.74	-6.47
	(-1.34)	(-1.39)	(-1.49)	(-1.59)
Industry cum. sales over *t+1* to *t+2*	0.25	0.41	0.42	0.49
	(0.31)	(0.48)	(0.56)	(0.62)
Industry cum sales over *t+1* to *t+2* [Malaysia]	8.31	11.67	8.27	9.43
	(2.54)**	(2.67)***	(2.46)**	(2.18)**
Log of sales in *t–2*	-0.62	-0.75	-0.74	-0.91
	(-1.64)	(-1.57)	(-2.10)**	(-1.93)*
Log of sales in *t–2* [Malaysia]	0.83	0.40	1.00	1.06
	(0.92)	(0.45)	(1.20)	(1.22)
Investment over *t–2* to *t*	0.23	0.24	0.24	0.26
	(2.52)**	(2.46)**	(2.49)**	(2.91)***
Cumulative investment over *t–2* to *t* [Malaysia]	-0.50	-0.93	-0.49	-0.86
	(-1.46)	(-1.88)*	(-1.50)	(-1.47)
Interest coverage in *t*	0.05	0.07	0.07	0.08
	(0.74)	(0.84)	(1.13)	(1.08)
Interest coverage in *t* [Malaysia]	0.26	0.46	0.23	0.36
	(1.14)	(1.49)	(1.02)	(1.42)
Debt to total assets in *t*	-0.22			
	(-0.51)			
Debt to total assets in *t* [Malaysia]	0.24			
	(0.23)			
Debt to market value in *t*		0.18		
		(0.34)		
Debt to market value in *t* [Malaysia]		4.66		
		(1.45)		
Loans to total assets in *t*			0.05	
			(0.09)	
Loans to total assets in *t* [Malaysia]			-0.37	
			(-0.24)	
Loans to market value in *t*				1.20
				(1.73)*
Loans to market value in t [Malaysia]				4.03
				(0.58)
Adjusted R-squared	0.31	0.42	0.30	0.37
Probability (F- statistic)	0.04	0.01	0.04	0.02
No. of observations	35	35	35	35

*** Indicates significance at the 0.01 level; ** significance at the 0.05 level; * significance at the 0.10 level. OLS regression results for control and financial structure variables used to explain sales growth cumulated over *t+1* to *t+2*. White's heteroskedastic-consistent standard errors are reported and t-statistics appear in parentheses.

and lending interest in these firms appear to be large enough to create the incentives which large creditors need to monitor and to bring about improvements in poorly operating firms or to help them work through distress. In Malaysia, distressed firms do not seem to have this kind of access to credit, which partly explains why (for Malaysian firms) investment is negatively associated with their financial structure. One interpretation of the Malaysian results is that asymmetric information and conflicts among creditors may have became more accentuated when these firms became distressed, and this may have undermined their efforts at renegotiating new lines of credit.

The sample selected for this study is relatively small. However, it is not unusual to have rather small samples in studies of this kind; the sample size of studies of this kind is constrained by the very nature of the issue being examined. If we examine corporate distress during periods of prolonged economic recession, we are likely to find much larger samples of firms. However, since our analysis covers periods of normal growth in Malaysia and Thailand, this implies that the number of firms experiencing distress is likely to be small. We are, however, mindful that the smallness of the sample has implications for inferences, which we might make to the corporate sector or the country as a whole. For this reason, a certain amount of caution should be exercised in interpreting the results, not only because of the sample size, but also because of the limited explanatory power of some of our regressions.

Notwithstanding these concerns, our findings on distressed firms investment and sales performance and the role of financial structure are supported by a number of studies. Many of these studies show that distressed-firms benefit from establishing long term relationships with banks. In Japan, HKS show that firms with main bank ties perform better after the onset of distress than firms without such ties. In Germany, Cable (1985) found a positive relationship between bank-firm relationship and the profitability of large firms, while for small firms, Harhoff and Körting (1998) found a positive association between lending relationship and the availability and price of credit. Similarly, in Korea, members of "Chaebol" groups, which include a main bank, have better access to financing than non-group firms (Cho 1995). Even in the US, where banks deal more on a transactions basis, Petersen and Rajan (1994) found that more credit is available to small firms, which maintain close ties with banks than those without such ties.

Notwithstanding these findings, the results from the sales regressions cast doubt on the efficiency of the financing decisions of Thai banks. While Thai banks appear ready to finance their firms' investment, the investment projects financed by Thai firms in the post-distress period may have been of poor quality and may not have generated higher sales. Simply put, Thai distressed firms may have been over-investing. Although banks and other creditors make investment finance available to these firms, it appears that there has been far less diligence exercised over how these funds have been invested, to ensure that the existing capital stock is efficiently utilised.

In contrast, although the systems of industrial finance in Malaysia appear to have withheld credit from Malaysian firms that became financially distressed, this action may have forced these firms to invest their limited resources more efficiently, and to raise their efficiency in the post-distress period. As the sales results show, the differential coefficients on the Malaysian-distressed firms proxy are always positive, suggesting that financial factors have a greater positive influence on the sales performance of Malaysian-distressed firms than that of non-distressed Malaysian or Thai firms.

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