

Corporate Debt Restructuring: The Response in Emerging Asia and the United States When Interest Rates Fell

by

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Abstract

This paper explores corporate financial structure using data for the United States, Hong Kong, Indonesia and Korea, Malaysia and Thailand. We consider whether debt structure responds similarly in emerging Asia and the US, whether there is a distinct low-interest rate effect on corporate debt, and whether we can isolate demand- and supply-side effects of falling interest rates. Finally, we explore the extent to which firms that are relatively bank dependent, small or based in manufacturing industries face greater sensitivity to balance sheet variables that influence supply. We conclude that while the response to variables is similar in the US and emerging Asia, there are significant differences as monetary policy loosens, and there is evidence of stronger supply-side response in the US. Firm type does influence the sensitivity of the response to the balance sheet.

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1. Introduction

After the Asian crisis of 1997 many Asian economies experienced a sharp depreciation of exchange rates and a loss of confidence that caused stock market and property prices to fall. To prevent exchange rates from falling, and to reduce capital outflows, many governments in Asia raised interest rates, but between 1998 and 2000 interest rates were cut drastically, and the period after 2000 saw much lower interest rates than had been experienced before the crisis, in some cases these were less than half of pre-1997 levels. This occurred because in the United States there was a dramatic reduction in interest rates from 2001-2003. For most emerging Asian economies the failure to match interest rate reductions in the US would have resulted in sharply appreciating exchange rates – with an adverse effect on exports – the growth of which had, to a large extent, allowed these economies to recover from the crisis of 1997.² This paper is about the implications of low interest rates for the restructuring of corporate debt by firms in Asia.

Lower interest rates might be expected to boost investment and output levels. A lower policy rate has a direct effect on the cost of borrowing for the firm, and if this falls below the expected return on the marginal investment project it will result in the growth of investment demand and greater uptake of credit. Through this direct interest rate channel under lower interest rates the increase in demand for investment stimulates the economy, raising output. On the supply side, because firms become financially more healthy, and their creditworthiness generally improves with lower interest rates, financial institutions are often inclined to increase the supply of credit with a loosening of monetary policy (see Bernanke *et al.* 1996, 1998, Kiyotaki and Moore, 1997). Previously constrained firms (or even firms that were totally excluded from the credit market) are able to borrow larger (non-zero) amounts on better terms (Gertler and Gilchrist, 1994). Thus the incentives facing the borrower and the lender when interest rates fall increase the demand and supply of credit (c.f. Bougheas *et al.*, 2006), influencing both the total debt and the balance between short-term and long-term debt, with implications for the financial structure of the firm.

² The annual average of the Federal Funds rate fell to just 1.13 percent in 2003 from a value of 6.24 in 2000. In Hong Kong the linked exchange rate system meant that interest rates fell from around eight percentage points to two-and-three-quarter percentage points – or by two-thirds. The exposure of the Hong Kong economy to US monetary policy has been noted by Gerlach and Peng (2005) in their investigation of the relationship between bank lending and property prices. Other Asian economies experienced similar falls in rates despite the absence of any mechanical link with US rates.

The structure of capital in the firm has been the subject of empirical research for many decades (see Rajan and Zingales, 1995, and references therein) and a smaller but more focused literature has considered debt composition and maturity (c.f. Demirguc-Kunt and Macsimovic, 1999, and Bougheas *et al.*, 2006). Increasingly, there has been interest in the comparison between corporate financial structure and debt composition in developed and emerging markets. Demirguc-Kunt and Macsimovic (1999) explore the impact of firm characteristics and market infrastructure on the financing decisions of firms in 30 countries in the period 1980-1991. They find that countries with more active stock markets tend to have greater numbers of large firms with long-term corporate debt and countries with large banking sectors experience greater short-term debt and longer maturities of debt for small firms. Booth *et al.* (2001) concur with this finding; they discover that for the largest 100 publicly quoted firms in ten developing countries the long term debt level is below the G-7 median. Their main conclusion, however, is that the determinants of capital structure are essentially no different between developed and developing countries because there is considerable evidence that firm-specific variables such as profitability and collateral assets influence debt ratios in the same way that they do for developed countries (c.f. Rajan and Zingales, 1995), although non-negligible country differences remain.

In this paper we consider the effects of lower interest rate on corporate financial structure in the United States, Hong Kong, Indonesia, Korea, Malaysia and Thailand after controlling for firm-specific variables justified by appealing to a pecking order model of capital structure (Myers and Majluf, 1984).³ We focus on three issues – first, how do firms’ short-term and long-term debt levels adjust to macroeconomic and firm-specific variables in the US v. Asia? We have already noted that previous studies of capital structure by Rajan and Zingales (1995), Demirguc-Kunt and Maksimovic (1995, 1999) and Booth *et al.* (2001) point to similarities in the response of developed and developing countries. Second, we explore whether there is evidence during the low interest rate period that the response to the interest rate of firms’ holdings of shorter and longer maturities of debt differed from times when the interest rate was higher. Terrones (2004) and Mendoza and Terrones (2007) have considered the possibility that credit has grown excessively in this period, but we are not aware of studies that consider the effects of lower rates

³ Our focus is therefore different from the papers referenced earlier since we do not attempt to test or discriminate between different financial models of corporate financial structure such as the Static Trade Off, Agency Theoretic and Pecking Order Hypothesis models. Booth *et al.* (2001) indicate that conclusive empirical separation of the

on capital structure. Third, we isolate whether demand or supply-side factors drive credit uptake and debt composition. The levels of real short-term and long-term debt will be driven by both, but the ratio of short-term debt to total debt is likely to reflect the supply-side response (Kashyap, Stein and Wilcox, 1993).

A comparison of the liabilities of several Asian economies and the United States in Table 1a gives a preliminary glimpse at the financial composition and changes that took place between 1998 and 2003. Our figures are book values of liabilities broken down into shareholder equity, share capital, debt, for which long-term and short-term debt can be distinguished, and bank loans and overdrafts. Debt constitutes a large proportion of the total liabilities of firms in all the economies we consider – between 35 and 40 percent in the United States, Indonesia and Korea, and between 23 and 28 percent in Malaysia and Thailand and only Hong Kong is lower at 17 to 19 percent⁴. The debt level hardly varies as a proportion of total liabilities in the US, Hong Kong, Malaysia and Thailand between the first period, 1998-2000, and the second low-interest rate period, 2001-2003, but drops by a half in Indonesia and by a fifth in Korea. In US dollar terms the total liabilities are larger in the 2000-2003 period compared to 1998-2000 for Asian countries, and total debt is smaller for Indonesia, Korea and Thailand, but debt of all types is larger for the US (recorded in \$mn). After 2000, long term debt takes a larger share of total debt, although there is only a small increase in the proportions in Malaysia and Korea.

In the remainder of the paper we use firm-level data in the United States, Hong Kong, Malaysia, Indonesia, Korea and Thailand retrieved from the Thomson Financial database and Datastream to give figures for short-term and long-term debt, bank lending and total debt. The levels and ratios of these debts are explained in fixed effects regressions using variables to reflect debt gearing, liquidity, solvency, and collateral assets of firms as well as interest rates and GDP growth. We find significant macroeconomic and firm-specific influences on credit under lower interest rates. When we consider the ratio of short-term to total debt we find strong supply-side effects which are more influential in the US than Asia. When we allow for firm type, there is a significant difference in the response to balance sheet variables for firms that are relatively more bank dependent or manufacturers, but no systematic difference for small firms. We conclude that

alternative models of capital structure is difficult given the data available especially because the different models result in similar empirical specifications.

⁴ By contrast shareholder equity is small – typically less than 25%, while for Indonesia it is below 10%, and the US below 5% - only Hong Kong has a high proportion of shareholders equity in total liabilities at approximately 40%.

the response of corporate financial structure as monetary policy loosens differs in Asia compared to the United States, possibly due to greater informational asymmetry.

The paper is organised as follows. We present a brief discussion of the post-crisis experience of the Asian economies in our sample followed by a discussion of the characteristics and sources of the data we use for our analysis in section 3. The methodology is explained in section 4, results are given in section 5 and finally section 6 concludes.

2. The Post-Crisis Experience of Five Asian Economies.

Immediately following the Asian crisis of 1997 many economies in emerging Asia experienced a depreciation of their exchange rates and a subsequent loss of confidence that caused stock market and property prices to fall. This greatly undermined the creditworthiness of firms and financial institutions, which, combined with the deterioration of capital flows, meant firms faced a sharply restricted supply of credit. This was due in part to the poor state of their own balance sheets, but was also exacerbated by the weakness of Asian financial institutions that focused on restructuring, recapitalizing and reducing their lending to domestic borrowers. Monetary policy tightened in most countries in the aftermath of the crisis to counter the depreciation of the currency, and this hit credit markets hard, although international agencies and commercial banks offered loan rollovers of short-term debt and lengthened maturities of existing debts to attempt to mitigate the effects of the crisis⁵.

As a result of these effects, there was a sharp initial deterioration in real investment and GDP growth. For all five emerging Asian economies in our study the real investment growth was negative in 1998 as was real GDP growth. Indonesia experienced a 46.6% real reduction in investment growth, similar to Malaysia at 40.5%, Thailand at 37.0%, with Korea slightly less severe at 26.8%; Hong Kong was less affected with a real reduction of around 7%. GDP was strongly affected by investment and fell by 14.4% in Indonesia, 6.9% in Malaysia, 8.0% in Thailand, 5.5% in Korea and 5% in Hong Kong according to the International Monetary Fund *World Economic Outlook*, 1998. The most severe experiences were in those countries with the most highly leveraged companies prior to the crisis – Korea, Thailand and Indonesia. Much of the corporate debt was foreign currency denominated therefore the reversal of capital flows with

⁵ Radlett and Sachs (1998), Furman and Stiglitz (1998) and Mishkin (1999) provide excellent summaries of the experience and lessons from the Asian crisis.

the subsequent depreciation of the exchange rate had a sharp adverse effect on investment and output, giving a clear example of the effects of a “sudden stop” (c.f. Calvo, 1998). Firms in four of these economies were able to benefit from improvements in competitiveness following the depreciation of the currency, allowing the economies to bounce back to positive growth from 1999. In contrast, Hong Kong faced depressed conditions that extended to the 2000-2003 period and US growth also slowed in that period in real terms, reducing demand for credit in these two economies.

3. Data

In what follows we make use of firm-level data for five Asian economies - Hong Kong, Indonesia, Korea, Malaysia and Thailand - and the United States. The original data are retrieved from the Thomson Financial database and Datastream to give book values for short-term and long-term debt and total debt and variables from the balance sheet⁶. After allowing for the fact that there are missing observations in the balance sheet for some companies, a sample of 427 firms in Hong Kong, 113 in Indonesia, 320 in Korea, 270 in Malaysia, 113 in Thailand and 720 firms in the United States. These firms are present for the entire sample from 1998 – 2003 and are formed into separate balanced panels for each country.

We take three different dependent variables, the logarithm of real short-term debt (*RSTD*) i.e. debt of one year or less to maturity, the logarithm of real long-term debt (*RLTD*) i.e. debt of over one year to maturity, and the ratio of short-term debt to total debt (*RATIO*). These variables are designed to reflect the behavior of capital structure in a similar way to the variables used by Demirguk-Kunt and Macsimovic (1999), who measure long-term and short-term debt scaled by total assets as two separate independent variables, and the composition of debt by the proportion of long-term debt to total debt i.e. $(1 - \text{RATIO})$. This ratio is also similar to the Long-term Book-debt ratio used by Booth *et al.* (2001).

We evaluate the behavior of these variables using a vector of independent variables chosen to explain macroeconomic and firm-specific effects and again the choice of variables is motivated by the literature on capital structure and debt composition⁷. We measure

⁶ We are grateful to the Hong Kong Institute for Monetary Research and Dickson Tam for providing the data for this project.

⁷ Note that where the explanatory variable is in logarithms these variables are converted to logarithms.

macroeconomic demand conditions by an indicator of the business cycle based on the firm-invariant GDP growth rate and the level of the official interest rate⁸. Demirguk-Kunt and Macsimovic (1999) similarly use growth and inflation as indicators of macroeconomic conditions. In addition, as the main purpose of their paper is to illustrate institutional effects on debt maturity, they use measures such as the ratio of bank assets to GDP, government grants over GDP and indicators of law and order, credit and shareholder rights to capture institutional features driving debt structure, but since this is not our main interest we do not include these variables.

We include a range of firm-specific variables to capture the influence of heterogeneous firm characteristics on debt structure in common with the literature. Rajan and Zingales (1995) refer to the market-to-book value of equity, the tangible asset ratio in total assets, log sales as a proxy for size and profitability to explain long-term book debt and market debt ratios. Similarly, Booth *et al.* (2001) use the same variables plus risk, average tax rates, and the return on assets, which help to differentiate between alternative models of corporate financial structure, which we do not address here. Other papers on debt composition such as Demirguk-Kunt and Macsimovic (1999) use net fixed assets in total assets as an indicator of the collateral assets available to the firm, also profitability and net sales over total assets. They also discuss two measures of liquidity – dividends over total assets and the ratio of earnings before interest and tax to total assets – to measure the cash constraints on the firm. Bougheas *et al.* (2006) use a measure of size based on real assets, a one-year risk of default measure, profitability, age as an indicator of the possibility of relationship lending from banks, and lagged debt as determinants of access to debt.

In our paper we use the ratio of tangible assets to total assets, COL_{it} , to indicate the access to collateral assets which were very important in studies by Rajan and Zingales (1995), Demirguk-Kunt and Macsimovic (1999), and Booth *et al.* (2001). We use a measure of the solvency ratio, $SOLVE_{it}$, which is the ratio of shareholder equity over the book value of total assets and is therefore similar to the market-to-book ratio used by Rajan and Zingales (1995) and Booth *et al.* (2001). To recognise the cash constraints on the firm following reasoning of Spence (1985) and Demirguk-Kunt and Macsimovic (1995, 1999) we have a measure of access to liquid assets, LIQ_{it} . Finally, we allow for the total debt to equity ratio, $GEAR_{it}$, which is the gearing ratio

⁸ Since we control for cyclical effects arising from the stage of the business cycle using GDP growth we do not use time dummies as these would be collinear with GDP_{it} and $RATE_{it}$.

found to be an important explanation of debt composition in Bougheas *et al.* (2006)⁹. Following an agency cost argument (see Bernanke *et al.*, 1996) we expect these variables to influence firms' access to credit, and by observing the significance of the coefficients we can gauge the responses of creditors to idiosyncratic balance sheet characteristics of firms.

Table 1b gives a description of the characteristics of these variables over the 1998-2000 and 2000-2003 periods. The firms in our sample represent manufacturing, financial, transportation, wholesale, construction and service sectors, although the majority of the firms are in manufacturing or service industries irrespective of the country under consideration. We observe that a large number of firms are small or medium sized in the emerging Asian economies by comparing the real asset values (RASSET) at the 25th and 75th percentile. The 75 percentile is an order of magnitude larger than the 25 percentile and the median is well below the mid point between the 75 and 25 percentiles. This is a point we will address when we split firms according to type, including size, before observing the response to low interest rates of firms in different categories.

Information about financial health of companies can be observed from Table 1c, which reports the percentiles of the distribution of variables of interest across countries for the periods immediately after the crisis, 1998-2000 and when interest rates were lower in the 2000-2003 period. The first three variables indicate the scale of log real short-term, long-term and total debt and in the immediate aftermath of the crisis these were much larger for firms in Hong Kong and Korea than for firms in Indonesia, Malaysia and Thailand.

By looking at the ratio of short-term debt to total debt, however, we see things from a different perspective. For the emerging Asian economies of Indonesia, Malaysia, Thailand and Hong Kong the ratio is nearly 100% for firms at the 75th percentile, and at the median the ratio is above two-thirds; even at the top 25th percentile, the ratio is above one third. The US is remarkably different in several respects. The logarithm of real short-term debt held by firms is much lower than that of Asian countries, and the ratio of short-term debt to total debt is only 2-3% at the 25th percentile, 10-15% at the median and 20-30% at the 75th percentile. This means that US firms have a much lower proportion of short-term debt in total debt compared to emerging Asian firms.

⁹ Further details of these variables are provided in the data appendix.

By comparing the tables for 1998-2000 and 2000-2003 we can observe the effects of lower interest rates on short-term and long-term debt. The absolute values of the logarithm of real debt fell for all categories, but the proportion of debt held as short-term debt also declined, and there is a noticeable shift in the distribution of the ratio that indicates a smaller proportion of debt is held at shorter maturities for firms at the median and the top 25th percentile. Looking at the balance sheet we see that gearing (the debt to equity ratio) also declines from 1998-2000 to 2000-2003, while solvency and liquidity of firms increases for all countries, and collateral assets remain constant. Asian firms reduced their debt overall, and held more long-term debt as a proportion of total debt; they were financially more healthy on the basis of lower gearing, higher liquidity and solvency with similar collateral levels. The next section explains the econometric methods used to explore the data, before we consider how firms adjusted their capital structure as interest rates fell.

4. Econometric Methodology

We estimate a fixed effects regression of the form:

$$y_{it} = x_{it}\beta_1 + RATE_t\beta_2 + GDP_t\beta_3 + D9798\beta_4 + \lambda_t + \eta_i + v_{it}; \quad (1)$$

$$t = q+1, \dots, T; \quad i = 1, \dots, N$$

where η_i , λ_t and v_{it} are individual specific effects, time specific effects, and disturbance terms, respectively, $t = q+1, \dots, T$ is a time index, and $i = 1, \dots, N$ is a firm index. y_{it} is the dependent variable and x_{it} is a matrix of firm-specific variables. The variable $RATE_t$ is the interest rate and GDP_t is the growth rate of GDP, both are macroeconomic variables that are not firm-specific. The dummy variable $D9798$ takes a value of one during the years 1997 and 1998 to capture the effect of the Asian crisis. Our results are estimated using STATA 8.0 with a large N , small T panel of firms for each country using fixed effects.

Booth *et al.* (2001) explore the merits of pooled regressions, fixed and random effects estimators of corporate structure. They conclude that the industry and country differences and the missing observations in an unbalanced panel are sufficient to undermine the common intercept assumption of the pooled regression. Fixed effects capture these idiosyncrasies but may be more biased than pooling if there is measurement error. A Hausman test rejects the random effects model.

Our decision to use fixed effects is based on three considerations. First, when we examined the extent of the biases identified by Nickell (1981) in preliminary panel estimators, a comparison between

OLS, fixed effects and GMM showed coefficient estimates for the OLS estimator were upwardly biased as expected, but the fixed effects and GMM estimators were very similar. This suggested that the extent of the (downward) bias in fixed effects estimates was small. Second, the estimated coefficients on lagged dependent variables were small and insignificant in the majority of cases which suggested that dynamic terms were unlikely to be important, removing the main objection to the fixed-effects estimator in the presence of dynamic terms. Third, our relatively small samples would make GMM estimates imprecise resulting in low significance for many variables and weaker tests for significance of differences between coefficient estimates in split samples. Following this reasoning we report results below that are based on fixed effects regressions which we believe can be reliably used to generate the results¹⁰.

Our first question, posed in the introduction, about whether the response of debt composition differs between the US and emerging Asian firms, is answered by comparing the signs and significance of our explanatory variables in our fixed effects regressions. Since we do not estimate equation (1) in a common panel we cannot test directly for country effects as Booth *et al.* (2001) have done, but we can see by the relative magnitudes and significance whether our results are supportive of their conclusions.

Our second question refers to the effects of low interest rates on corporate debt structure. Here we make use of the interest rate, $RATE_t$ to construct an interaction dummy LP , which is an indicator variable taking a value of one when rates were low and zero otherwise. By interacting the interest rate with the low period indicator variable (LP) we can separate the response of the three dependent variables to interest rates during low periods from the response at other times. The hypothesis we test is whether the low interest rate episode stimulates the uptake and provision of credit through the demand- and supply-side effects, and allows firms to restructure their debt. The evidence for this will be observed by a significant coefficient on the interacted dummy and interest rate variables ($RATE_t * LP$)¹¹. Our revised model is

$$y_{it} = x_{it}\beta_1 + RATE_t\beta_2 + (RATE_t * LP)\beta_3 + GDP_t\beta_4 + D9798\beta_5 + \lambda_t + \eta_i + v_{it}; \quad (2)$$

¹⁰ Using similar reasoning Mulkay, Hall and Mairesse (2000) opt for fixed effects estimators in their study based on relatively small samples of data. Alternative estimators proposed by Anderson and Hsiao (1981) and Arellano and Bond (1991) to cope with dynamic terms have been implemented by among others Bond *et al.* (2003)

¹¹ The use of interactive terms has also been employed by Gerlach, Peng and Shu (2004) when exploring banking performance in Hong Kong using panel data methods.

$$t = q+1, \dots, T; \quad i = 1, \dots, N$$

When seeking to explain the behavior of variables such as the log of real short-term and long-term debt, *RSTD* and *RLTD*, we expect both demand and supply effects to play a role in determining their levels. However, following the reasoning of Kashyap *et al.* (1993, 1996), Oliner and Rudebusch (1996) who argue that demand effects in the numerator and denominator of *RATIO* broadly cancel, when we refer to the ratio of long-term to total debt, *RATIO*, we expect supply effects to dominate. This effectively deals with the identification issue, allowing us to separate the supply-side response from the effects of demand under low rates.

Finally, after considering the results from the full sample for the *RATIO* in each country we split the sample in order to determine whether (relatively) bank dependent firms, small firms and manufacturing firms from each country have different responses to less bank dependent and larger firms in the same country. The first two samples are formed by splitting the distribution of firms according to their bank debt in total debt and the real asset value at the median, while the last category is determined by the SIC code. Thus we are able to tell whether firms within each country panel that are relatively more/less dependent on banks, smaller/larger or manufacturing/non-manufacturing have different responses in restructuring debts when interest rates fall. We are able to consider the behavior of firm types during the two periods 1998-2000 and 2001-2003.

5. Results

Our results are reported in Tables 2-5. These give the responses of three variables – the logarithm of real short-term debt, the logarithm of real long-term debt and the ratio of short-term debt to total debt – to macroeconomic and firm-specific determinants of credit. These explanatory variables include the level of the interest rate, which is also interacted with a dummy variable (LP) to allow for any change in behavior that occurs when rates fall to low levels, the effect of output measured by GDP growth, and a range of balance sheet variables to capture debt-gearing, solvency, liquidity and collateral asset levels. We report results based on separate country panel estimates of the response of firms' debt structure in the US and five Asian economies: Hong Kong, Indonesia, Korea, Malaysia and Thailand. We are interested in three issues, first, the comparison of the response of emerging Asian firms versus those in the US, second, whether the

response to rates during the low interest rate period compared to the rest of the sample, and third, the importance of demand versus supply-side factors in driving credit uptake and composition.

We begin with the results for the logarithms of real short-term debt and real long-term debt, as reported in Tables 2 and 3. Tables 2a and 3a report the results for the sample without an interaction term for the low interest rate period, while Tables 2b and 3b report the results with an interaction term. First, we observe consistent evidence in terms of signs and magnitudes that indicates the balance sheet variables have an influence on the log-level of real short term debt for US and Asian firms. Gearing and solvency have a positive effect on both short-term and long-term debt and therefore influence availability of debt, but not the composition in terms of its maturity. The responses to liquidity and collateral are consistently negatively signed for short-term debt and positively signed for long-term debt, suggesting that these variables are important determinants of debt maturity. The results are similar to Rajan and Zingales (1995) and Booth *et al.* (2001) who find evidence of the importance of tangible assets in developed and developing countries respectively, and Demirguk-Kunt and Maksimovic (1999) who find net fixed assets in total assets (collateral) and profitability, measured by earnings before interest and tax over total assets (which they regard as a measure of liquidity), are important in 30 developed and emerging market economies. A firm with more liquidity or collateral assets is more likely to obtain long-term debt, while a firm with less may at best obtain short-term debt. The magnitudes differ between countries, as found in Booth *et al.* (2001) but the pattern is consistent.

For macroeconomic variables such as interest rates there is most often a negative or insignificant effect on short-term and long-term debt (except for Thailand), while GDP growth has a positive effect (except for Indonesia, which had considerable political as well as economic instability in our sample). There is therefore some consistency between the US and Asian results in terms of signs, but a difference in terms of magnitudes of the coefficients on each variable. On the macro-side the response to GDP is much greater in the US, while there is no effect of interest rates on real short-term debt levels. Firm-specific variables indicate that firms' real short-term debt in the US responds more strongly to liquidity, and less to solvency and gearing (and not at all to collateral) compared with emerging Asian countries, while the reverse is true for long-term debt. Probably the most notable results is the fact that collateral plays no role in determining the levels of real short-term and long-term debt levels of firms in the US, while in emerging Asia this variable is a highly significant determinant of both, reducing the level of short-term debt and

increasing the level of long-term debt. This most likely reflects the relative information asymmetries in the respective regions. We conclude that fundamentally the same variables drive the debt structure of firms, and the response of firm-level debt to these variables is remarkably similar, although collateral is an exception, and country differences are evidence in the magnitude of the responses.

Turning to our second question, we observe the effect lower interest rates have on logarithms of real short- and long-term debt levels. We can see this effect in the sign and significance of the interacted *LP* dummy with the *RATE_t* variable in Tables 2b and 3b. These findings are reported after controlling for growth rates – which are included to allow for business cycle influences on demand for credit – therefore any changes in response to the interaction term for low interest rates is not picking up cyclical effects in output. The results indicate that there was a stronger negative effect of interest rates on short-term debt levels in Indonesia, but elsewhere lower rates had a weaker effect on real short term debt (Hong Kong, Thailand) or no influence (the United States, Korea, Malaysia). Long-term debt responded more strongly to interest rates in Indonesia, Korea, and Malaysia in this period, but while lower rates resulted in higher real long-term debt in Indonesia and Korea, they led to lower long-term debt in Malaysia. Hence in the low interest rate episode the response to rates was stronger for three out of five Asian countries and more so for long-term debt, but the findings do not appear to provide a systematic pattern of response when rates fall to low levels.

Our third question addresses debt maturity between short-term and long-term debt and can reasonably be assumed to isolate supply side effects (see Kashyap *et al.*, 1993). Table 4 reports the coefficient estimates allowing for an interaction term with the low interest rate period. It is noticeable that output growth, which had a positive coefficient in previous tables that we interpreted as an indicator of macroeconomic demand effects on short-term and long-term debt, does not have a positive coefficient for any country. Rather output growth has an insignificant effect on the ratio, or an influence that is negative, suggesting that the improvements in growth brought about a reduction in the ratio of short-term to total debt. We infer that this is likely to reflect the expanding supply of credit at lengthening maturity as business prospects improve.

For all but a few exceptions the coefficients on balance sheet variables *SOLVE*, *LIQ* and *COL* have negative signs indicating that short-term debt as a proportion of total debt falls with higher solvency, liquidity and collateral. The finding is consistent with the credit channel

hypothesis (see Bernanke *et al.* 1996) and results from the improvement in financial health that relaxes constraints on the supply-side and allows firms to obtain more external credit, at longer maturities and possibly on better terms. The ratio of short-term debt to total debt also falls marginally with higher debt levels, *GEAR*. The response to higher debt is expected to be ambiguous (see Bougheas *et al.*, 2006) since it is associated with high-growth firms and with riskier firms. The former would expect to obtain more long-term debt but the latter to obtain less, so the impact of higher debt is not clear cut. All we can say in this case is that on balance the former group dominates the latter group shifting the ratio in the direction of long term debt. We conclude that supply-side response is consistently observed across all countries operating through the balance sheet. There is some effect of GDP growth in Korea, Malaysia and Thailand where the ratio of short-term debt to total debt falls, and for these countries, and Indonesia lower rates increase the ratio of short term debt in total debt. The effect of lower rates elsewhere – in the United States and Hong Kong – has the opposite effect, causing the maturity of debt to lengthen and the proportion of short-term debt in total debt to fall. This appears to be a supply-side response and results because a lower rate increases long-term debt in both countries but has a smaller effect on short-term debt in Hong Kong and none at all in the United States. The response to falling rates of interest is stronger for the US (per percentage point change) than for most Asian countries and this tells us debt expands more readily in the US as monetary policy loosens compared to Asian economies.

Finally, we consider the effect of firm types on the responses of the ratio of short-term to total debt to our explanatory variables. We split the sample of firms into bank-dependent v. non-bank dependent firms, small v. large firms and manufacturing v. non-manufacturing firms¹². The splits are around the median for the distribution of bank borrowing and for the distribution of asset size within each country, and on the basis of the industrial sector of each firm. Results are reported in Tables 5a-5c.

In Table 5a the sample split indicates that the response to balance sheet variables is greater for those firms that are relatively more bank dependent than for firms that are relatively less dependent on banks. There is evidence (from larger absolute values of significant variables)

¹² It is understood from theoretical considerations based on information asymmetry and from empirical studies that are smaller, younger and less financially secure firms can have greater constraints over access to credit than large, older, secure firms. The firms in our dataset include a large number of firms that are likely to be constrained in the

of greater sensitivity to indicators of solvency, liquidity and collateral for bank dependent firms for firms in all countries, that bank dependent firms show a stronger response to supply-side effects stemming from measures of improved creditworthiness on their balance sheets. The sample split between bank dependent and non-bank dependent firms has a more obvious effect on our results than the split between small and large firms, as demonstrated by Table 5b. This is somewhat surprising since developed country studies typically find that the small v. large distinction is also important, with smaller firms being more sensitive to balance sheet variables than larger firms (c.f. Gertler and Gilchrist, 1994, where size is a key proxy for capital market access in studies of the US manufacturing sector). Even studies involving developing countries find a distinction between small and large firms (c.f Demirguk-Kunt and Maksimovic, 1999) although in this case the distinction is to be found in the response to legal and institutional variables, and is explained by the fact that small firms can seldom take advantage of the developments on legal and institutional grounds because they have limited access to market finance. In our data there is no evidence to suggest that our distinction between small and large firms is important in emerging Asian countries. This may be due in part to the fact that most firms in emerging Asia have little access to capital markets, and despite being *relatively* smaller according to the sample split, this does not truly distinguish between firms that have access to direct finance from markets and those that do not. In Table 5c, we see that the coefficient values for manufacturing firms are greater in absolute value compared to non-manufacturing firms, and in many countries are significant where the coefficients for non-manufacturing firms are insignificant. This suggests that the distinction between whether a firm is from the manufacturing sector or the non-manufacturing sectors is more important for access to external finance than the issue of firm size. This could indicate that sectors involved in manufacturing have greater access to export markets, growth opportunities and also credit compared to services, transportation, wholesale and other sectors (see Chaney, 2005) but their supply of credit will be determined by balance sheet characteristics.

6. Conclusions

credit market due to their characteristics when monetary policy is tight. We are investigating the impact of loosening policy on the financial structure of these and other types of firms.

This paper explores the impact of low interest rates on corporate financial structure and credit booms in the United States and emerging Asia. Using data for the United States, Hong, Kong, Indonesia and Korea, Malaysia and Thailand we separate macroeconomic and firm-specific effects of falling interest rates on the corporate debt structure of firms. We have four main findings. First, we demonstrate that firms in emerging Asian economies respond to the same fundamental drivers of debt structure as firms in the United States, confirming the evidence in Booth *et al.* (2001). Second, the low interest rate period has a significant effect on the debt structure, causing short-term debt to increase faster in response to rate changes with no corresponding effect on long-term debt in much of Asia. But for the US and Hong Kong the effect of low rates is to increase the responsiveness of long term debt to rate changes. The differences reflect the the readiness of debt to expand when monetary policy loosens in the US versus emerging Asia.

Third, when we attempt to separate demand-side and supply-side responses to variables by considering the ratio of short-term debt to total debt we find that there is a strong supply-side response in both the US and emerging Asia to firm-specific variables. These variables are considered influential over access to credit in the literature (see Bernanke *et al.*, 1996) and we confirm their importance in the US and emerging Asia. The strength of the effects is greater for the US. Lastly, we illustrate that for firms that are relatively bank dependent or part of the manufacturing sector the sensitivity of the ratio of short-term in total debt to balance sheet variables is greater than for other firms. A small v. large firm distinction is not as important among Asian firms, in contrast to most industrialised country studies that find small firms face greater sensitivity to balance sheet variables. This may reflect the lack of access to market finance even for medium-large firms in Asia.

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Data Appendix

<i>Variable</i>	<i>Definition</i>
RSTD	Log of real short-term loans
RLTD	Log of real long-term loans
RTD	Log of real total debt
RATIO	Short term loans/total debt*100 (%)
RASSET	Real asset value (US\$)
RATE	Interest rate (percentage points)
GDP	GDP growth rate (percentage points)

GEAR	Total debt/shareholder equity*100 (%)
SOLVE	Shareholder equity/total asset*100 (%)
LIQ	(current assets-stocks)/current liabilities*100 (%)
COL	Tangible assets/total assets*100 (%)
D9798	Asia crises dummy, D = 1 1997, 1998 zero otherwise

Removal of Outliers: We reduce the impact of outliers by cleaning the dataset, which trims 0.5 percent of observations from upper and lower tails of the distribution for the gearing ratio, the solvency ratio, the liquidity ratio. The tangible assets-total asset ratio and financial mixes take values in the range of zero to one hundred therefore these variables are not trimmed.

Construction of Yearly Data from Annual Accounts: Firms release their balance sheet reports at various dates during the year. Supposing a firm reports at the end of March each year, the variables for year t are calculated based on weighted averages of t and t+1 figures in the ratio 25%:75%. Appropriate percentages are used for firms reporting in other months.

Table 1a: Types of External Finance by Category

	United States				Indonesia				Korea			
	1998-2000 average	%	2000-2003 average	%	1998-2000 average	%	2000-2003 average	%	1998-2000 average	%	2000-2003 average	%
TOTAL LIABILITIES	130140.9	100.0	165517.8	100.0	343374.8	100.0	494406.9	100.0	2336966.0	100.0	2424062	100.0
Shareholders' equity	4337.072	3.3	4349.265	2.6	21807.3	6.4	75125.0	15.2	362228.9	15.5	427394.9	17.6
Share capital	29295.05	22.5	35904.25	21.7	49100.5	14.3	63387.5	12.8	130207.5	5.6	140953.7	5.8
Debt (TD)	56669.78	43.5	69403.13	41.9	146022.9	42.5	110706.4	22.4	828380.7	35.4	695541.7	28.7
Long-Term Debt (LTD)	29110.96	22.3	39494.49	23.9	66824.4	19.5	60052.4	12.1	466313.4	20.0	406422.8	16.8
Short-Term Loans (STD)	27759.1	21.3	30077.07	18.2	63685.7	18.5	50654.0	10.2	313814.4	13.4	289305.5	11.9
Current Maturities	n/a		n/a		26456.2	7.7	13325.1	2.7	114743.0	4.9	110561	4.6
U&O short-term loans	n/a		n/a		18476.2	5.4	27059.9	5.5	195249.6	8.4	174338.6	7.2
Bank loans & overdrafts	n/a		n/a		93939.8	27.4	51110.7	10.3	34956.5	1.5	14322.56	0.6
	Hong Kong				Malaysia				Thailand			
	1998-2000 average	%	2000-2003 average	%	1998-2000 average	%	2000-2003 average	%	1998-200 average	%	2000-2003 average	%
TOTAL LIABILITIES	161111	100	2307692	100	386073.8	100.0	498318.3	100.0	583463.5	100.0	576651.2	100.0
Shareholders' equity	652739	40.5	885578	38.4	89509.5	23.2	117278.5	23.5	66850.7	11.5	86540.8	15.0
Share capital	572276	35.5	784020	34.0	39814.1	10.3	54233.3	10.9	56662.9	9.7	82830.7	14.4
Debt (TD)	282186	17.5	438786	19.0	91746.9	23.8	101436.5	20.4	165919.9	28.4	137990.8	23.9
Long-Term Debt (LTD)	229181	14.2	405244	17.6	49196.6	12.7	55068.3	11.1	94132.2	16.1	95506.8	16.6
Short-Term Loans (STD)	85364	5.3	100754	4.4	42496.6	11.0	46545.5	9.3	62066.7	10.6	38209.1	6.6
Current Maturities	58334	3.6	84490	3.7	8628.3	2.2	10129.4	2.0	21648.4	3.7	13066.8	2.3
U&O short term loans	25354	1.6	20513	0.9	27852.3	7.2	31937.7	6.4	32196.4	5.5	21791.5	3.8
Bank loans & overdrafts	188900	11.7	254807	11.0	20845.5	5.4	18925.3	3.8	53497.3	9.2	35195.3	6.1

Notes: currency units are US\$, except USA where the units are US\$mn

Table 1b: Descriptive Statistics

	United States				Indonesia				Korea			
	1998-2000				1998-2000				1998-2000			
	Obs.	Mean	Median	Std. D.	Obs.	Mean	Median	Std. D.	Obs.	Mean	Median	Std. D.
RSTD ⁺	1588	8.8	7.2	2.4	735	8.8	9.1	2.4	1335	10.6	10.7	2.4
RLTD ⁺	1737	8.7	8.9	2.0	613	8.4	8.9	3.0	1296	10.4	10.6	2.6
RTD ⁺	1776	9.0	9.2	2.1	816	9.6	10.0	2.4	1373	11.4	11.4	2.4
RATIO	1736	25.8	15.2	28.1	816	59.2	67.1	38.9	1373	55.3	56.5	28.4
GEAR	1816	462.6	34.3	5439.0	926	450.3	42.6	5519.8	1419	415.5	78.8	3598.3
LIQ	1480	192.6	143.8	196.3	924	135.1	52.3	473.4	1419	129.3	76.7	544.9
SOLVE	1903	34.4	36.0	62.1	926	19.5	24.4	55.2	1419	30.3	35.8	76.5
COL	1524	4.34	2.7	5.4	926	34.0	29.9	25.8	1419	35.0	35.2	21.4
	2000-2003				2000-2003				2000-2003			
RSTD ⁺	2463	7.0	7.2	2.7	730	8.1	8.3	2.4	1541	10.0	10.1	2.5
RLTD ⁺	2682	9.0	9.1	1.9	644	8.1	8.8	3.0	1420	9.9	9.8	2.6
RTD ⁺	2726	9.2	9.3	1.9	806	8.9	9.3	2.4	1588	10.7	10.6	2.4
RATIO	2686	21.7	10.9	26.3	806	54.5	53.5	38.2	1588	57.5	59.5	30.6
GEAR	2857	355.0	53.3	3579.0	938	321.9	28.7	5465.3	1734	94.6	50.9	808.7
LIQ	2303	225.3	143.8	1117.6	938	127.6	68.1	299.4	1734	135.9	85.4	196.3
SOLVE	2933	39.4	38.1	37.2	938	29.5	38.4	55.5	1734	41.9	44.9	69.1
COL	2625	4.24	2.4	5.8	938	34.5	31.8	25.6	1734	34.9	33.2	21.3

Notes: RSTD = Log of real short-term loans; RLTD = Log of real long-term loans; RTD = Log of real total debt; RATIO = Short term loans/total debt*100 (%); GEAR = Total debt/shareholder equity*100; SOLVE = Shareholder equity/total asset*100; LIQ = (current assets-stocks)/current liabilities*100 (%); COL = tangible assets/total assets. ⁺ variables in logarithms, * currency units are US\$, except USA where the units are US\$mn

Table 1b (cont.): Descriptive Statistics

	Hong Kong				Malaysia				Thailand			
	1998-2000				1998-2000				1998-2000			
	Obs.	Mean	Median	Std. D.	Obs.	Mean	Median	Std. D.	Obs.	Mean	Median	Std. D.
RSTD ⁺	826	11.36	11.68	2.48	2142	9.1	9.2	2.1	1084	9.1	9.4	2.4
RLTD ⁺	691	11.33	11.45	3.00	1912	7.9	8.0	2.8	824	9.1	9.1	2.6
RTD ⁺	840	12.08	12.23	2.64	2170	9.5	9.7	2.1	1129	9.8	10.1	2.5
RATIO	840	61.56	66.32	32.94	2173	69.8	79.5	29.7	1129	64.5	77.7	35.8
GEAR	938	41.94	24.71	99.32	2369	-15.6	34.3	6673.6	1252	189.1	50.5	3946.0
LIQ	938	51.92	56.21	37.68	2372	134.4	74.9	532.3	1253	271.1	57.6	1807.1
SOLVE	938	204.84	93.17	622.61	2370	-117.8	47.4	5081.5	1253	22.0	35.8	132.9
COL	938	35.48	31.07	25.82	2370	41.8	41.9	24.0	1253	39.8	38.4	27.3
	2000-2003				2000-2003				2000-2003			
RSTD ⁺	699	11.40	11.57	2.48	2213	8.9	9.1	2.2	1059	8.5	8.7	2.3
RLTD ⁺	578	11.53	11.73	3.26	1922	8.1	8.2	2.8	843	9.1	9.2	2.7
RTD ⁺	719	12.22	12.38	2.70	2247	9.5	9.6	2.2	1100	9.4	9.6	2.6
RATIO	719	58.74	60.18	35.31	2248	66.5	75.5	31.6	1100	56.9	57.3	36.7
GEAR	855	37.03	21.13	93.44	2477	76.6	28.2	822.5	1233	989.4	37.4	28326.8
LIQ	855	55.43	60.70	33.20	2478	198.2	80.3	834.8	1233	144.0	74.5	408.8
SOLVE	855	280.75	106.41	811.47	2477	7.5	53.8	378.3	1233	20.8	44.0	192.4
COL	855	33.37	28.17	26.20	2477	41.2	41.1	24.6	1233	39.3	38.6	26.3

Notes: RSTD = Log of real short-term loans; RLTD = Log of real long-term loans; RTD = Log of real total debt; RATIO = Short term loans/total debt*100 (%); GEAR = Total debt/shareholder equity*100; SOLVE = Shareholder equity/total asset*100; LIQ = (current assets-stocks)/current liabilities*100 (%); COL = tangible assets/total assets. ⁺ variables in logarithms, * currency units are US\$, except USA where the units are US\$m

Table 1c : Percentile Distribution of Basic Variables across Countries and Periods

Percentile	Indonesia		Korea		Malaysia		Thailand		Hong Kong		USA		
	1998-2000	2000-2003	1998-2000	2000-2003	1998-2000	2000-2003	1998-2000	2000-2003	1998-2000	2000-2003	1998-2000	2000-2003	
RSTD ⁺	25	7.5	6.8	9.2	8.8	8.0	7.9	7.9	7.3	10.1	10.1	5.3	5.3
	50	9.1	8.3	10.7	10.1	9.2	9.1	9.4	8.7	11.7	11.7	7.2	7.2
	75	10.5	9.7	12.3	11.6	10.4	10.2	10.7	10.0	13.1	13.1	8.9	8.7
RLTD ⁺	25	6.7	6.7	8.8	8.2	6.2	6.3	7.5	7.6	9.3	9.3	8.05	8.1
	50	8.9	8.8	10.6	9.8	8.0	8.2	9.1	9.2	11.4	11.7	9.2	9.1
	75	10.6	10.2	12.3	11.7	9.9	10.0	10.8	10.9	13.4	13.8	10.3	10.2
RTD ⁺	25	8.3	7.6	9.9	9.4	8.4	8.4	8.7	8.2	10.7	10.7	7.8	8.3
	50	10.0	9.3	11.4	10.6	9.7	9.6	10.1	9.6	12.3	12.4	8.9	9.3
	75	11.3	10.6	13.1	12.2	10.9	10.8	11.4	11.0	13.8	14.0	10.0	10.5
RASSET [*]	25	11013	8811	91744	63937	20259	24928	21340	19670	348890	300200	13553	16687
	50	36926	28002	267342	172991	49224	55648	50571	45443	1044075	1164078	35228	37848
	75	112806	79831	1106974	573191	165221	170309	149125	138496	4186608	5048980	104967	171035
RATIO	25	19.4	17.1	35.2	33.3	48.1	41.4	32.6	22.0	32.0	27.0	2.8	2.1
	50	67.1	53.5	56.5	59.5	79.5	75.5	77.7	57.3	66.4	60.4	15.2	10.9
	75	99.9	99.2	77.8	84.0	96.4	96.9	100.0	99.1	97.1	98.4	40.1	30.3
GEAR	25	0.0	0.0	23.2	11.7	3.3	2.0	0.2	0.7	3.7	0.8	4.9	5.3
	50	42.6	28.7	78.8	50.9	34.3	28.2	50.5	37.4	24.3	20.8	34.1	53.2
	75	213.8	122.3	191.6	124.2	100.0	81.6	189.1	139.8	56.5	52.1	641.9	895.0
SOLVE	25	4.0	10.6	18.8	27.5	25.9	30.2	11.5	21.7	37.8	39.4	20.1	21.4
	50	24.4	38.4	35.8	44.9	47.4	53.8	35.8	44.0	56.0	60.7	36.0	38.2
	75	50.9	62.1	51.9	63.1	67.6	72.0	62.6	67.7	73.8	77.1	51.7	56.5
LIQ	25	20.7	28.2	48.8	51.4	39.2	42.3	24.9	36.9	48.0	57.1	101.8	103.6
	50	52.3	68.1	76.7	85.4	74.9	80.3	57.6	74.5	91.0	106.4	143.8	151.0
	75	114.6	140.1	116.8	139.9	127.7	151.2	117.9	147.9	157.3	192.3	217.2	231.1
COL	25	10.1	10.2	16.1	17.9	23.4	22.6	15.5	16.2	14.4	10.2	12.5	10.0
	50	29.9	31.8	35.2	33.2	41.9	41.1	38.4	38.6	31.4	27.9	27.1	24.5
	75	54.7	55.2	51.7	51.3	58.9	58.2	60.7	58.5	54.7	51.8	52.5	50.1

Notes: RSTD = Log of real short-term loans; RLTD = Log of real long-term loans; RTD = Log of real total debt; RATIO = Short term loans/total debt*100 (%); GEAR = Total debt/shareholder equity*100; SOLVE = Shareholder equity/total asset*100; LIQ = (current assets-stocks)/current liabilities*100 (%); COL = tangible assets/total assets. ⁺ variables in logarithms, * currency units are US\$, except USA where the units are US\$mn.

Table 2a: Fixed Effects Estimates for Log of Real Short-Term Debt (RSTD)

No Interaction Term	United States	Hong Kong	Indonesia	Korea	Malaysia	Thailand
RATE	-0.010 (-0.86)	-0.052*** (3.85)	-0.120*** (18.54)	-0.009 (1.35)	0.021** (2.25)	0.183*** (17.57)
GDP	0.102** (2.34)	0.013** (2.49)	-0.385*** (19.66)	-0.006 (1.29)	0.022*** (5.16)	0.111*** (13.53)
D9798		0.041 (0.78)	3.528*** (22.66)	-0.250*** (4.02)	-0.098* (1.69)	-1.506*** (16.08)
LGEAR	0.527*** (16.3)	0.928*** (41.52)	0.890*** (26.51)	0.897*** (40.80)	0.876*** (67.93)	0.775*** (41.36)
LSOLV	0.867*** (9.65)	1.253*** (19.97)	1.119*** (18.65)	0.972*** (24.50)	0.967*** (29.14)	0.946*** (24.09)
LLIQ	-1.891*** (-24.8)	-0.401*** (10.51)	-0.528*** (12.11)	-0.661*** (15.91)	-0.469*** (19.88)	-0.815*** (27.30)
LCOL	-0.036 (-1.25)	-0.133*** (3.01)	-0.035 (0.68)	-0.367*** (9.46)	-0.306*** (12.09)	-0.511*** (10.51)
Constant	10.591*** (18.8)	6.151*** (16.38)	5.751*** (12.59)	7.434*** (22.26)	5.080*** (25.98)	6.483*** (23.04)
Observations	4303	2128	1669	3712	5469	2714
No. of firm	684	338	324	649	852	456
R-squared	0.21	0.56	0.55	0.49	0.59	0.66

Table 2b: Fixed Effects Estimates for Log of Real Short-Term Debt (RSTD)

Intercept term	United States	Hong Kong	Indonesia	Korea	Malaysia	Thailand
RATE	-0.008 (-0.70)	-0.037** (2.40)	-0.095*** (13.32)	-0.008 (0.95)	0.022 (1.62)	0.154*** (12.32)
RATE*LP	0.018 (1.15)	0.025* (1.94)	-0.046*** (7.60)	0.000 (0.03)	0.002 (0.12)	-0.117*** (4.09)
GDP	0.090** (2.02)	0.017*** (3.00)	-0.284*** (12.16)	-0.006 (1.13)	0.022*** (4.77)	0.100*** (11.52)
DUM9897		0.078 (1.41)	2.629*** (13.63)	-0.250*** (3.89)	-0.100 (1.63)	-1.359*** (13.57)
LGEAR	0.525*** (16.2)	0.929*** (41.59)	0.885*** (26.90)	0.897*** (40.76)	0.876*** (67.91)	0.772*** (41.30)
LSOLVE	0.869*** (9.67)	1.253*** (19.99)	1.117*** (19.01)	0.972*** (24.46)	0.967*** (29.12)	0.947*** (24.21)
LLIQ	-1.890*** (-24.7)	-0.404*** (10.58)	-0.538*** (12.59)	-0.661*** (15.91)	-0.469*** (19.88)	-0.810*** (27.17)
LCOL	-0.037 (-1.30)	-0.134*** (3.03)	-0.010 (0.20)	-0.367*** (9.42)	-0.305*** (12.08)	-0.514*** (10.61)
Constant	10.586*** (18.8)	6.022*** (15.80)	5.470*** (12.18)	7.431*** (21.64)	5.073*** (24.63)	6.742*** (23.45)
Obs.	4303	2128	1669	3712	5469	2714
No of Firm	684	338	324	649	852	456
R-squared	0.21	0.56	0.57	0.49	0.59	0.66

Notes: Regressions of log real short term debt on interest rate (RATE), GDP growth (GDP), an Asian crisis dummy (D9798), log gearing (LGEAR), log solvency (LSOLVE), log liquidity (LLIQ) and log collateral (LCOL). The second table includes a low rate interaction dummy (LP). Each regression is from a balanced panel of firms for the country reported in the column. Absolute value of t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 3a: Fixed Effects Estimates for Log of Real Long-Term Debt (RLTD)

No intercept term	United States	Hong Kong	Indonesia	Korea	Malaysia	Thailand
RATE	-0.084 (-16.1)	-0.078*** (3.84)	-0.077*** (7.43)	0.021*** (2.94)	0.008 (0.46)	0.112*** (7.52)
GDP	0.232*** (11.6)	0.021*** (2.63)	-0.220*** (7.00)	0.012** (2.32)	0.010 (1.30)	0.087*** (7.32)
D9798		0.037 (0.48)	1.980*** (7.99)	-0.474*** (6.89)	0.038 (0.37)	-1.121*** (8.44)
LGEAR	1.178*** (74.9)	1.094*** (25.00)	1.045*** (18.70)	1.026*** (36.75)	1.101*** (38.01)	1.056*** (26.93)
LSOLVE	1.191*** (29.0)	1.015*** (10.00)	1.015*** (10.66)	0.805*** (17.07)	1.017*** (16.37)	1.002*** (15.53)
LLIQ	0.286*** (8.33)	0.356*** (6.23)	0.920*** (13.15)	0.575*** (12.57)	0.424*** (9.76)	0.621*** (15.06)
LCOL	-0.010 (-0.79)	0.472*** (6.48)	0.323*** (2.93)	0.153*** (3.51)	-0.012 (0.25)	-0.090 (1.35)
Constant	-1.928*** (-7.51)	0.956 (1.54)	-2.725*** (3.55)	-0.125 (0.32)	-1.573*** (4.05)	-1.897*** (4.02)
Observations	4596	1825	1478	3517	4908	2140
No. of firm	701	309	304	632	822	411
R-squared	0.64	0.34	0.37	0.40	0.28	0.37

Table 3b: Fixed Effects Estimates for Log of Real Long-Term Debt (RLTD)

Intercept term	United States	Hong Kong	Indonesia	Korea	Malaysia	Thailand
RATE	-0.083*** (-15.7)	-0.082*** (3.43)	-0.068*** (5.78)	-0.000 (0.03)	0.049** (2.05)	0.097*** (5.42)
RATE*LP	0.013* (1.91)	-0.005 (0.27)	-0.016* (1.68)	-0.035*** (3.05)	0.059** (2.39)	-0.062 (1.50)
GDP	0.223*** (10.9)	0.020** (2.40)	-0.182*** (4.75)	0.004 (0.62)	0.017** (2.15)	0.081*** (6.46)
DUM9897		0.030 (0.37)	1.651*** (5.22)	-0.415*** (5.81)	-0.050 (0.46)	-1.043*** (7.33)
LGEAR	1.176*** (74.8)	1.093*** (24.92)	1.038*** (18.53)	1.023*** (36.64)	1.100*** (37.99)	1.053*** (26.83)
LSOLVE	1.192*** (29.1)	1.014*** (9.98)	1.008*** (10.59)	0.795*** (16.86)	1.012*** (16.30)	1.000*** (15.51)
LLIQ	0.287*** (8.36)	0.356*** (6.24)	0.919*** (13.14)	0.573*** (12.54)	0.422*** (9.72)	0.623*** (15.12)
LCOL	-0.011 (-0.85)	0.472*** (6.48)	0.332*** (3.01)	0.165*** (3.78)	-0.010 (0.20)	-0.089 (1.35)
Constant	-1.932*** (-7.53)	0.991 (1.56)	-2.792*** (3.64)	0.164 (0.41)	-1.844*** (4.56)	-1.752*** (3.64)
Obs.	4596	1825	1478	3517	4908	2140
No of Firm	701	309	304	632	822	411
R-squared	0.64	0.34	0.37	0.40	0.28	0.37

Notes: Regressions of log real long-term debt on interest rate (RATE), GDP growth (GDP), an Asian crisis dummy (D9798), log gearing (LGEAR), log solvency (LSOLVE), log liquidity (LLIQ) and log collateral (LCOL). The second table includes a low rate interaction dummy (LP). Each regression is from a balanced panel of firms for the country reported in the column. Absolute value of t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 4: Fixed Effects Estimates for the Ratio of Short-Term Loans to Total Debt (RATIO)

	United States	Hong Kong	Indonesia	Korea	Malaysia	Thailand
RATE	1.256*** (8.39)	1.087** (2.51)	0.168 (0.98)	-0.626*** (2.73)	-1.381*** (3.73)	-0.434 (1.28)
RATE*LP	0.107 (0.54)	-0.136 (0.86)	-0.237* (1.68)	0.476* (1.77)	-1.241*** (3.25)	-2.150*** (2.80)
GDP	-0.624 (-1.08)	0.410 (0.26)	0.284 (0.51)	-0.384*** (2.91)	-0.350*** (2.80)	-0.739*** (3.13)
D9798		-0.000 (0.63)	-5.863 (1.28)	2.930* (1.72)	3.015* (1.77)	2.979 (1.09)
GEAR	-0.004** (-2.54)	-0.021* (1.68)	-0.000** (2.17)	-0.000 (0.84)	-0.000 (0.48)	-0.000 (1.27)
SOLV	0.356*** (13.6)	-0.005*** (3.30)	-0.036** (2.02)	0.028*** (3.96)	-0.004*** (3.00)	-0.008* (1.84)
LIQ	-0.054*** (-14.2)	-0.178*** (3.70)	-0.122*** (13.83)	-0.065*** (13.75)	-0.003*** (3.56)	-0.039*** (9.46)
COL	0.096 (1.27)	0.397 (1.09)	-0.273*** (4.27)	-0.367*** (8.12)	-0.087*** (3.11)	-0.179*** (3.83)
Constant	10.976*** (5.83)	62.170*** (17.60)	75.044*** (16.88)	79.680*** (25.56)	80.101*** (29.97)	77.151*** (23.88)
Observations	4934	2284	2216	4022	6059	3188
No. of firm	720	348	347	665	862	478
F-Stat	78.19***	4.13***	32.40***	30.60***	5.76***	21.99**
R-squared	0.10	0.02	0.12	0.07	0.01	0.06

Notes: Regressions of the ratio of short term debt to total debt on interest rate (RATE), GDP growth (GDP), an Asian crisis dummy (D9798), gearing (GEAR), solvency (SOLVE), liquidity (LIQ) and collateral (COL). The table includes a low rate interaction dummy (LP). Each regression is from a balanced panel of firms for the country reported in the column. Absolute value of t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5a: Bank Dependent v. Non-Bank Dependent Firms

	Hong Kong		Indonesia		Korea		Malaysia		Thailand	
	Bank Depend.	Non-Bank Depend.	Bank Depend.	Non-Bank Depend.	Bank Depend.	Non-Bank Depend.	Bank Depend.	Non-Bank Depend.	Bank Depend.	Non-Bank Depend.
RATE	1.707*** (3.10)	0.500 (0.75)	-0.245 (1.08)	0.593** (2.30)	-0.773** (2.40)	-0.581* (1.79)	-1.213** (2.55)	-1.584*** (2.76)	-0.240 (0.57)	-0.552 (1.02)
RATE*LP	-0.065 (0.33)	-0.199 (0.80)	-0.176 (0.95)	-0.310 (1.44)	0.260 (0.69)	0.572 (1.51)	-1.333*** (2.72)	-1.082* (1.84)	-1.496 (1.58)	-2.704** (2.21)
GDP	-0.036 (0.02)	1.141 (0.46)	-1.106 (1.49)	1.738** (2.05)	-0.352* (1.88)	-0.458** (2.49)	-0.337** (2.10)	-0.361* (1.86)	-0.512* (1.75)	-0.919** (2.45)
D9798	-0.000 (0.18)	-0.000 (0.57)	4.387 (0.72)	-16.636** (2.39)	1.935 (0.89)	3.502 (1.34)	3.191 (1.46)	2.584 (0.98)	1.072 (0.31)	3.899 (0.90)
GEAR	-0.016 (0.83)	-0.017 (0.99)	-0.000* (1.72)	-0.000 (1.41)	-0.000 (1.33)	-0.000 (0.23)	-0.000 (0.56)	0.000 (0.07)	-0.000 (0.60)	-0.000 (1.06)
SOLVE	-0.026*** (4.79)	-0.003** (2.00)	-0.046* (1.94)	-0.024 (0.93)	0.081*** (2.93)	0.025*** (3.31)	-0.003** (2.09)	-0.006** (2.05)	-0.022*** (2.62)	-0.002 (0.34)
LIQ	-0.382*** (6.31)	-0.001 (0.01)	-0.140*** (10.43)	-0.112*** (9.40)	-0.144*** (11.83)	-0.052*** (9.66)	-0.027*** (5.95)	-0.003** (2.39)	-0.062*** (7.04)	-0.033*** (6.67)
COL	1.036** (2.27)	-0.177 (0.31)	-0.358*** (4.42)	-0.151 (1.48)	-0.536*** (8.79)	-0.238*** (3.65)	-0.108*** (3.15)	-0.104** (2.24)	-0.327*** (5.95)	0.016 (0.20)
Constant	74.046*** (16.06)	53.806*** (9.96)	97.552*** (16.38)	51.239*** (7.64)	95.098*** (20.15)	71.623*** (16.92)	90.681*** (26.26)	72.683*** (17.20)	92.865*** (22.49)	61.506*** (11.98)
Observations	1161	1123	1154	1062	1762	2260	3154	2905	1656	1532
No. of firm	173	175	174	173	239	426	433	429	239	239
F-Stat	8.00***	1.23	20.34***	14.14***	25.16***	14.30***	6.69***	3.41***	13.80***	11.72***
R-squared	0.06	0.01	0.14	0.11	0.12	0.06	0.02	0.01	0.07	0.07

Notes: Regressions of the ratio of short term debt to total debt on interest rate (RATE), GDP growth (GDP), an Asian crisis dummy (D9798), gearing (GEAR), solvency (SOLVE), liquidity (LIQ) and collateral (COL). The table includes a low rate interaction dummy (LP). Each regression is from a balanced panel of firms for the country reported in the column. The first (second) column for each country reports the regression for (non-) bank dependent firms, where the ratio of bank loans in total debt is (above) below the median of the distribution for all firms in that country. Absolute value of t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5b: Small v. Large Firms

	United States		Hong Kong		Indonesia		Korea		Malaysia		Thailand	
	Small	Large										
RATE	1.360*** (6.01)	1.161*** (6.68)	1.610** (2.33)	0.740 (1.33)	-0.048 (0.19)	0.305 (1.33)	-1.368*** (3.98)	0.002 (0.01)	-1.292*** (2.88)	-1.459** (2.40)	0.385 (0.83)	-1.296*** (2.66)
RATE*LP	-0.069 (-0.23)	0.189 (0.83)	-0.122 (0.49)	-0.127 (0.62)	-0.463** (2.25)	-0.113 (0.58)	0.617 (1.54)	0.331 (0.98)	-1.283*** (2.78)	-1.153* (1.84)	-3.022*** (2.88)	-1.100 (1.00)
GDP	-1.106 (-1.27)	-0.516 (-0.77)	0.169 (0.07)	0.601 (0.31)	-0.360 (0.44)	0.747 (0.99)	-0.630*** (3.23)	-0.115 (0.68)	-0.334** (2.21)	-0.368* (1.78)	-0.077 (0.24)	-1.404*** (4.16)
D9798			-0.000 (0.63)	0.000 (0.31)	-1.980 (0.29)	-8.467 (1.36)	5.156* (1.88)	-0.394 (0.20)	2.949 (1.42)	2.965 (1.07)	-3.657 (0.97)	9.361** (2.42)
GEAR	-0.005** (-2.34)	-0.002 (-0.75)	-0.024 (1.60)	-0.007 (0.30)	-0.000 (0.01)	-0.000** (2.11)	-0.000 (0.44)	-0.000 (1.20)	-0.000 (0.57)	-0.000 (0.30)	-0.000 (0.79)	-0.000 (0.35)
SOLVE	0.420*** (12.0)	0.227*** (5.31)	-0.004** (2.38)	-0.032*** (4.39)	0.017 (0.66)	-0.088*** (3.59)	0.028*** (3.50)	0.024 (0.81)	-0.003** (2.46)	-0.006* (1.94)	0.004 (0.37)	-0.010* (1.88)
LIQ	-0.044*** (-9.23)	-0.139*** (-15.6)	-0.180*** (2.58)	-0.253*** (3.65)	-0.106*** (8.60)	-0.142*** (11.17)	-0.058*** (10.59)	-0.141*** (10.57)	-0.016*** (5.88)	-0.002* (1.71)	-0.080*** (9.31)	-0.028*** (5.79)
COL	0.083 (0.62)	0.050 (0.67)	0.609 (1.09)	0.336 (0.69)	-0.315*** (3.46)	-0.253*** (2.83)	-0.398*** (5.95)	-0.458*** (7.65)	-0.170*** (5.12)	-0.001 (0.03)	-0.254*** (4.17)	-0.184** (2.55)
Constant	6.642** (2.40)	26.810*** (10.8)	71.422*** (14.03)	60.485*** (11.55)	93.289*** (14.19)	59.806*** (9.97)	89.954*** (19.55)	77.606*** (18.05)	92.617*** (28.32)	67.646*** (15.42)	92.589*** (20.52)	69.360*** (14.75)
Observations	2939	1995	958	1326	1066	1150	2175	1847	3287	2772	1518	1670
No. of firm	509	345	174	174	177	170	381	284	493	369	230	248
F-Stat	41.42***	62.34***	2.46**	3.53***	13.32***	23.49***	20.26***	19.21***	8.56**	1.92*	20.42***	8.99***
R-squared	0.09	0.18	0.02	0.02	0.11	0.16	0.08	0.09	0.02	0.01	0.11	0.05

Notes: Regressions of the ratio of short term debt to total debt on interest rate (RATE), GDP growth (GDP), an Asian crisis dummy (D9798), gearing (GEAR), solvency (SOLVE), liquidity (LIQ) and collateral (COL). The table includes a low rate interaction dummy (LP). Each regression is from a balanced panel of firms for the country reported in the column. The first (second) column for each country reports the regression for (large) small firms, where the real assets are (above) below the median of the distribution for all firms in that country. Absolute value of t statistics in parentheses * significant at 10%; ** significant at 5%;

Table 5c: Manufacturing v. Non Manufacturing Firms

	United States		Hong Kong		Indonesia		Korea		Malaysia		Thailand	
	Man. Industry	Non-Man Industry	Man. Industry	Non-Man Industry	Man. Industry	Non-Man. Industry	Man. Industry	Non.Man. Industry	Man. Industry	Non.Man. Industry	Man. Industry	Non.Man. Industry
RATE	1.370***	1.168***	0.673	1.338**	0.156	0.177	-1.095***	-0.083	-1.058*	-1.566***	0.030	-0.912*
	(6.35)	(5.63)	(1.00)	(2.41)	(0.64)	(0.76)	(3.90)	(0.21)	(1.80)	(3.32)	(0.06)	(1.90)
RATE*LP	0.069	0.151	-0.118	-0.139	-0.615***	0.013	0.361	0.538	-1.188**	-1.246**	-1.410	-2.754**
	(0.24)	(0.55)	(0.47)	(0.69)	(2.99)	(0.07)	(1.08)	(1.21)	(1.97)	(2.57)	(1.32)	(2.53)
GDP	-2.250***	0.850	0.120	0.222	0.363	0.231	-0.563***	-0.197	-0.302	-0.381**	-0.413	-1.025***
	(-2.72)	(1.05)	(0.05)	(0.11)	(0.45)	(0.30)	(3.46)	(0.89)	(1.53)	(2.39)	(1.25)	(3.08)
D9798			-0.000	0.001	-10.101	-3.046	4.269**	1.035	1.118	3.936*	0.383	5.758
			(0.78)	(0.61)	(1.53)	(0.48)	(2.04)	(0.37)	(0.41)	(1.82)	(0.10)	(1.49)
GEAR	-0.003	-0.004*	-0.004	-0.025	-0.000*	-0.000*	-0.000	0.000	-0.000	-0.000	-0.000	0.000
	(-1.42)	(-1.95)	(0.19)	(1.53)	(1.68)	(1.67)	(1.44)	(0.55)	(0.55)	(0.42)	(1.26)	(0.55)
SOLVE	0.404***	0.317***	-0.054***	-0.004**	-0.065***	-0.015	0.031***	-0.042	-0.002	-0.004***	0.023**	-0.013**
	(10.4)	(8.87)	(6.13)	(2.26)	(2.70)	(0.60)	(4.56)	(1.19)	(1.00)	(2.62)	(2.06)	(2.47)
LIQ	-0.047***	-0.064***	-0.407***	-0.111*	-0.125***	-0.121***	-0.102***	-0.042***	-0.031***	-0.003**	-0.054***	-0.034***
	(-9.16)	(-11.1)	(4.81)	(1.90)	(10.17)	(9.71)	(13.16)	(6.53)	(6.13)	(2.53)	(6.80)	(6.89)
COL	0.113	0.065	0.198	0.707	-0.330***	-0.253***	-0.408***	-0.322***	-0.157***	-0.083**	-0.053	-0.223***
	(0.84)	(0.71)	(0.34)	(1.52)	(3.39)	(2.99)	(7.71)	(3.87)	(3.14)	(2.44)	(0.65)	(3.83)
Constant	13.078***	8.899***	86.032***	53.398***	93.262***	64.235***	92.632***	68.460***	90.602***	77.781***	78.687***	73.642***
	(4.78)	(3.40)	(14.99)	(11.90)	(13.20)	(11.17)	(23.16)	(13.42)	(20.11)	(23.22)	(14.68)	(17.53)
Observations	2326	2608	801	1483	880	1336	2355	1667	2019	4040	1410	1778
No. of firm	319	401	123	225	126	221	358	307	282	580	205	273
F-Stat	40.95***	36.75***	6.42***	1.93**	19.61***	15.40***	30.92***	7.61***	6.27***	3.76***	12.03***	12.31***
R-squared	0.11	0.09	0.08	0.01	0.17	0.10	0.11	0.04	0.03	0.01	0.07	0.06

Notes: Regressions of the ratio of short term debt to total debt on interest rate (RATE), GDP growth (GDP), an Asian crisis dummy (D9798), gearing (GEAR), solvency (SOLVE), liquidity (LIQ) and collateral (COL). The table includes a low rate interaction dummy (LP). Each regression is from a balanced panel of firms for the country reported in the column. The first (second) column for each country reports the regression for (non-) manufacturing firms, where the criterion is the SIC cde for the firms. Absolute value of t statistics in parentheses * significant at 10%; ** significant at 5%;