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**Financial Liberalization and Corporate Debt Maturity in Thailand,  
1993-97**

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**Abstract**

Excessive short-term debt is thought to be one of the major causes of the Asian financial crisis, and this paper documents the changes in the maturity of corporate debt in Thailand during a period of rapid integration with international capital markets. Using data from publicly-traded Thai corporations for the period 1993-97, we find that the evidence is weak at best that financial liberalization brought about by globalization reduced the maturity of corporate debt contracts, and the evidence may in fact support an increase in maturity. This result casts some doubts on the generality of the idea that financial liberalization created the short-term debt problem.

**JEL Classification:** G32, G15, D92, E65, F39.

**Keywords:** Globalization, financial liberalization, corporate debt maturity, Thailand.

## 1. Introduction

The Asian financial crisis of 1997, which was triggered by financial turmoil in Thailand in June 1997 and then spread to the rest of East Asia,<sup>1</sup> generated substantial interest in the nexus between financial globalization (and financial liberalization in particular) and corporate debt maturity. In particular, it has been argued that financial liberalization led to the shortening of debt maturity, since both firms and banks were given increased access and more choice over their portfolios without commensurate improvements in their long-term incentive structure and adequate prudential regulation. This in turn led to swift increases in macroeconomic fragility.

Researchers and policy-makers were thus led to reconsider the effects of financial liberalization, and eventually a new synthesis emerged, neatly captured by Kaminsky and Schmukler (2002), in which the effects of financial liberalization involve both short-term pain and long-term gain. The experience of South Korea became the archetype for this view, given both the relative importance of the South Korean economy in East Asia and the fact that the case strongly confirmed the new synthesis.<sup>2</sup>

In this paper, we examine the effects of financial liberalization on corporate debt maturity in Thailand, where the crisis began, and we consider whether the experience of South Korea generalizes to other countries. In particular, we consider whether Thai corporations increased their reliance on short-term debt in the run-up to the 1997 crisis, and whether this reliance resulted from financial liberalization or from other factors driving the maturity of corporate debt. We document the evolution of corporate debt maturity in Thailand during two different stages of international

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<sup>1</sup> See Corden, 2002: 209-212, and Isard, 2005: 142-144 for fascinating accounts of this crisis.

<sup>2</sup> See Booth, 2001, for the relevance of the issue for the South Korean macroeconomy, and Guerrero, 2006b, for a systematic documentation of the link between increased financial globalization and the shortening in corporate debt maturity in South Korea.

financial integration: early-stage financial globalization during 1993-94, and rapid financial globalization during 1995-97.

The remainder of this paper is organized as follows. Section two describes some specialized literature connected with this study and places this paper in context. Section three presents and discusses the main results of this investigation, including some robustness exercises. Section four concludes the paper.

## **2. Debt Maturity and Thailand's Crisis**

A number of studies have argued that debt maturity played a key role in the Asian financial crisis. Dadush, Dasgupta, and Ratha (2000) point out that half of all new loans from international banks in the period preceding the crisis had maturities of one year or less, and the volume of short-term debt grew fastest in East Asia. In Thailand short-term debt rose to around 120% of reserves (a figure that pales compared to the Korean figure of 200%), and since short-term borrowing was procyclical with the macroeconomy, the reversal in the balance of payments that came with the crisis was thus dramatic.

Alba, Hernandez, and Klingebiel (1999) argued that Thailand's financial crisis was fundamentally caused by private debt, and that financial liberalization was the main reason for this. Between 1990 and 1996, private external debt doubled as a share of Thailand's GDP, though the overall share of this debt that was short-term remained relatively stable, and the most dramatic expansion of international borrowing was by Thai banks and offshore institutions (i.e., the Bangkok International Banking Facility). Finance companies in particular began to borrow most of their funds with maturities of three months or less, and found their portfolio maturity increasingly mismatched. Financial liberalization, they argue, led to this borrowing

because it increased competition and reduced profit margins, thereby increasing incentives to practice unsound banking behavior in the absence of adequate prudential regulation. Financial liberalization was also accompanied by an increased international openness, so Thai firms had greater access to unhedged funds denominated in foreign currency, which made it susceptible to exchange rate risk.

What determines the maturity structure of corporate debt elsewhere? While much of the literature<sup>3</sup> on corporate debt maturity has concentrated on analyzing its effects on the value of the firm, there have been a number of studies on the external determinants of debt maturity, and some of this literature has focused on international case studies and comparisons. Barclay and Smith (1995), for example, find evidence that larger firms in the U.S. tend to have longer debt maturities, along with those firms under more regulation, while firms with more growth opportunities rely on shorter maturities, perhaps because of information asymmetries. These basic findings have been confirmed by several studies, including Stohs and Mauer (1996), Cunat (1999), Ozkan (2000 and 2002) for a sample of British firms, Heyman, Deloof, and Ooghe (2003) for a sample of small Belgian firms, and Chen, Ho, and Yeo (1999) for firms in Singapore.

Demirguc-Kunt and Maksimovic (1999) examined the capital structure of firms in 30 developing and developed countries during the period 1980-1991, and found that the presence of well-developed stock markets was an important determinant of the positive relationship between firm size and debt maturity, since small firms in countries where bank lending was the dominant form of finance tended to use relatively less short-term debt. Niskanen and Niskanen (2001) found for a sample of Finnish firms that bank ownership of stock helped solve the contracting

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<sup>3</sup> The literature on corporate debt maturity is much more extensive than what we review here, and a good summary can be found in Ravid (1996).

problem, so smaller firms with more bank ownership and growth opportunities were able to get longer maturities on their debts. Similarly, Datta, Iskandar-Datta, and Raman (2005) found that more managerial stock ownership led to shorter debt maturities.

Other studies have focused on the effects of specific policies or macroeconomic variables on the maturity of corporate debt, including, prominently, the impact of inflation on the shortening in the maturity structure of corporate debt (e.g., Klein, 1975; Aarstol, 2000; and Guerrero, 2004 and 2006a). Miller (1997) found evidence that political instability and polarization have an important role in creating inflation uncertainty and thus shorter debt maturities.

Closer to this paper are studies by Schmukler and Vesperoni (2001 and 2006) and Guerrero (2006b). Schmukler and Vesperoni (2001, 2006) conduct a cross-country study of the effects of globalization on firms' financing choices in an unbalanced panel of firms in eight Latin American and East Asian countries. Interestingly, Thailand is one of the countries in their study, though they did not derive country-specific conclusions and they were mainly interested in studying the effects of financial crisis on firms' financing choices. Guerrero (2006b) finds a reduction in corporate debt maturity prior to the Asian financial crisis for publicly-traded firms in South Korea, and traces back the origin of the phenomenon to the early stages of financial globalization. Finally, the debt maturity of Thai corporations in the run-up to the financial crisis has been studied by Wiwattanakantang, Kali, and Charumilind (2003), who found that firms with close relationships with banks were more likely to borrow with longer maturities.

### **3. The Effects of Liberalization on Corporate Debt Maturity in Thailand**

Was the reduction in the maturity of international debt mirrored in the patterns of corporate debt in Thailand, and are the initial effects of financial liberalization generalizable beyond the banking and financial sector? Did Thai corporations also respond to financial liberalization by taking advantage of increased access to short-term lending markets? Did Thai banks try to match the maturity of their domestic lending to that of their own international borrowing?

In this paper, we examine the maturity structure of corporate debt in Thailand, and how it responded to globalization, as measured by proxies for financial liberalization, increased access to international bond and equity markets, and the increase in the development of the domestic equity and financial markets. This paper purposefully excludes the period after 1997, because the focus is on the effects of globalization on corporate debt maturity in the years that lead to the crisis. Our data is a subset of the dataset used in Schmukler and Vesperoni (2001, 2006), but given the differences in goals and scope between this paper and theirs, we use a balanced panel to be able track the evolution of the same firms during the run-up to the crisis.

#### *3.1. Definition of Variables*

The dependent variable in all our regressions is the ratio of long-term debt to total debt (LTD/TD). Following the recent empirical literature that studies firms' financing decisions (e.g., Demirguc-Kunt and Maksimovic, 1999; Booth, et al., 2001; Schmukler and Vesperoni, 2001 and 2006) the vector of observable firm characteristics includes five variables. The first variable is a proxy for the size of the firm, the logarithm of a firm's net fixed assets (NFA). The second variable is an indicator of asset tangibility, the ratio of net fixed assets to total assets (NFA/TA).

The third variable, an indicator of firms' revenues, is the ratio of net sales to net fixed assets (S/NFA). The fourth variable proxies the profitability of firms with the ratio of profits to total assets (PF/TA). Descriptive statistics for these five variables are shown in Table 1.

<Insert Table 1 here>

To capture the potential effects of expanded financing opportunities through increased access to international bond and equity markets on the maturity of corporate debt, two proxies for access to international debt and equity markets are included. The variable capturing access to international bond markets is a dummy variable (BONDS) that takes the value of one for periods in which a given firm issues bonds in international capital markets, and zero otherwise. The variable capturing access to international equity markets is defined as a dummy variable (EQUITY) that takes the value one from the moment when a firm starts trading (or raising capital) in international equity markets, and zero otherwise.

Two alternative measures to proxy for financial liberalization are used. First, we use the arithmetic average of four individual financial liberalization indices (AFLI) that capture the degrees of liberalization of interest rates caps, the degree of control of private credit by the central bank, the level of marginal and average reserve requirements, and restrictions to both capital inflows and capital outflows. Each of the individual indices takes three possible values (1, 2, or 3), where 3 represents full financial liberalization, 2 partial financial repression, and 1 full financial repression. The information to construct these indices was taken from Kaminsky and Schmukler (2002). This multidimensional index of financial liberalization is the reported in the

tables below. We also considered a dummy variable that follows the stock market liberalization dates reported in Bekaert and Harvey (2000), but the results were unchanged.

To control for the effects of rapid development of the domestic equity and credit markets on the maturity of corporate debt, we follow Beck, Demirguc-Kunt and Levine (2000) and proxy for the degree of financial development (FD) with the sum of both stock market capitalization and the outstanding liabilities of the banking sector, expressed as a share of GDP.

The inflation rate, as measured by the rate of change of the Consumer Price Index), and the real GDP growth rate were both used to control for the effects of the macroeconomic environment on the maturity of corporate debt. Neither had a significant effect in our regressions, so we do not report these results in the tables below.

### *3.2. Econometric Estimations and Baseline Results*

We estimate six different alternative specifications: (i) Ordinary Least Squares, (ii) firm-specific Fixed Effects, (iii) Random Effects, (iv) Instrumental Variables, with the right-hand-side regressors instrumented using first lags, (v) Fixed Effects and Instrumental Variables, using both the first and second lags as instruments, and (vi) the Arellano-Bond (1993) specification, using a dynamic panel data Generalized Method of Moments procedure that controls both for the potential endogeneity of the microeconomic variables used as right-hand-side regressors, as well as for the potential time-series problems of the left-hand-side endogenous variable. Results for these baseline regressions are shown in Table 2. All regressions include an unreported constant term.

The OLS estimate provides the basic multivariate correlation embedded in the data, and these results are shown in column 1 of Table 2. However, OLS estimates are usually criticized when used with individual or firm-level data because they do not control for unobservable characteristics that could be biasing the estimated coefficients or introducing a potential reverse causation problem. To control for some of these unobservable characteristics, the firm-specific Fixed Effects estimation procedure is estimated, and the results are shown in column 2. Because the fixed-effects estimates disregard all the cross-sectional variation, we also include an alternative (static) panel data technique using Random Effects estimates, with a weighted average of the purely cross-sectional estimate and the Fixed Effects estimates. These estimates are shown in column 3.

The purely cross-sectional estimates are not included here for a couple of reasons. First, they are subject to similar criticisms as OLS estimates. There is also problem of the “between groups”, or purely cross-sectional estimate, in the present context is that by the very nature of our estimates completely disregards the time dimension of the data.

Given the potential endogeneity of most – if not all – of the observable firm characteristics (size, tangibility of assets, profitability, etc), instrumental variable estimates that use the value of these variables lagged once presented in column 4, while estimates that combine fixed effects with two lags as instruments are given in column 5.

Finally, column 6 contains the results produced by the Arellano-Bond (1993) estimation procedure, a more sophisticated instrumental-variables procedure that also takes care of potential problems of non-stationarity, by first differencing the data and including the lag of the dependent variable as a right-hand-side regressor.

<Insert Table 2 here>

As Table 2 shows, the most significant microeconomic determinants of corporate debt maturity are the firm's size (NFA) and the tangibility of its assets (NFA/TA). Consistent with the literature, we find that larger firms hold longer debts. The negative sign for the tangibility of assets implies that more tangible assets are associated with shorter maturity; this result is consistent across specifications and stands in opposition to what is usually observed in other case studies (in South Korea, for instance, as reported in Guerrero, 2006b). No other microeconomic determinant of corporate debt is statistically significant for all or most econometric specifications, and this result is also different from results previously found for other emerging economies (e.g., Schmukler and Vesperoni, 2001, or Guerrero, 2004). The sales ratio is insignificant, and the effect of profitability is insignificant in all cases but the fixed effect model, where the effect on maturity is negative.

For the variables proxying the effects of financial globalization, we find that a firm's access to international bond markets (BONDS) is positive and statistically significant in the first four specifications, but not in the last two. This result is in line with the ones reported in Schmukler and Vesperoni (2001, 2006). We dropped the EQUITY variable due to multicollinearity problems in these initial estimations.

The next proxy for financial integration to the international markets is AFLI, the multidimensional index of financial liberalization. This variable is insignificant in all specifications but the last, where it is positive. In the GMM specification, the index for financial liberalization has a lengthening effect in corporate debt maturity, a finding that contradicts the ones in Schmukler and Vesperoni (2001, 2006) and

Guerrero (2006b). This result suggests that it is not so clear that financial liberalization led to a shortening of debt maturity, at least for listed corporations in Thailand, and it may in fact have had the reverse effect.

Finally, the FD variable that proxies for the degree of financial development of the domestic financial sector displays a similar pattern to AFLI, in that that it is insignificant in all but the last and most relevant specification, the only one that explicitly controls for potential dynamic problems; the indicator for Financial Development displays a significant degree of inertia, as does the dependent variable, so a dynamic specification is probably the most appropriate. In the GMM specification, FD displays a strong and significant lengthening effect on the maturity of corporate debt. Therefore, the overall effect of increased financial integration during the early stages of globalization is probably to lengthen the maturity of corporate debt, a finding that is in contrast to those reported previously by Schmukler and Vesperoni (2001, 2006), for an unbalanced panel of East Asian firms during the period 1980-99, and Guerrero (2006b), for the case of South Korea at an early stage of financial globalization.

### *3.3. Robustness of the Access Measurements*

Given the collinearity problem affecting the dummy variables BONDS and EQUITY for access to international capital markets in the regressions reported above, we next consider an alternative proxy for the access variables. Specifically, we combine the two access variables into one, by measuring the number of times that firms had access to either the international bonds or equity markets. The results are not very different from the ones displayed in Table 2 above, and are not shown

separately, but the combined access variable becomes statistically and economically insignificant in all specifications.

A legitimate concern with the baseline regressions shown in Tables 2 and described above is related to the potential endogeneity bias introduced by the access variables. To address that potential source of trouble, two strategies were followed. First, we use first lags of the same proxies used in Table 2, under the assumption that these lags were predetermined variables. Second, we follow a twofold procedure in which we use lags of the same variable as instruments. For access to equity markets, following both Schmukler and Vesperoni (2006) and Ozkan (2000), we use two lags as instruments. For access to bonds markets, we construct an instrument that indicates whether capital markets were open. This instrument, first proposed by Schmukler and Vesperoni (2001), takes a value of one if two conditions are fulfilled: (i) At least one firm had access to international bonds markets during that period, and (ii) the firm was able to issue international bonds at least once during the sample period. Otherwise, the instrument takes a value of zero. The results provided by the two strategies are shown in Table 3.

<Insert Table 3 here>

Results are similar to the ones presented in Table 2 before. First, larger firms, and those with less tangible assets, have longer debt maturities. The sales variable remained insignificant in all cases and was dropped, while profit rates are now also insignificant in all cases. Access to the international bonds market continues to have had a positive effect on maturity in four of the specifications, though not the same four cases. Access to international equity markets has a mixed effect, positive in the

OLS and IV specifications, negative in the dynamic GMM specification, and insignificant in the other three. Financial liberalization and the degree of financial development both continue to conform to the results in Table 2, with both having a significant and positive effect on maturity in only the GMM specification.

Indeed, if this last specification is the most appropriate, as we have argued, then financial globalization had a significant lengthening effect on corporate debt maturity through three different channels: financial liberalization, domestic capital markets development, and increased access to international bond markets. The only force that partially offsets these lengthening effects is given by the access to international equity markets.

#### **4. Conclusion**

Using a balanced panel for publicly traded Thai firms, this paper documented the evolution of corporate debt maturity during the period prior to Thailand's financial crisis in 1997, and considered whether or not financial liberalization caused Thai corporations to increase their short-term debt, as the new synthesis has argued. While our results do confirm that larger firms used more long-term debt, we found the effects of financial liberalization to be not so clear. Using six different specifications, we found some evidence that access to the international bonds market actually increased debt maturity, and while the effects of financial liberalization and financial development were mostly insignificant, we found that the dynamic specification we thought most appropriate to the data yielded positive and significant effects for both of these variables. Our evidence here stands in stark contrast with previous findings for other East Asian economies, especially in South Korea, and thus our results call into question the generality of the new synthesis. Thailand's financial sector may

have borrowed heavily using short-term debt instruments from international markets, but it is not so clear that Thailand's corporations did the same.

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**Table 1: Summary Statistics for Microeconomic variables**

Variables		Mean	Std Dev	Max	Min	# of Observations	
LTD/TD	overall <sup>1</sup>	0.264	0.241	0.929	-0.035	N <sup>4</sup> =	883
	between <sup>2</sup>		0.209	0.788	0.000	n <sup>5</sup> =	182
	within <sup>3</sup>		0.119	0.777	-0.314	T-bar <sup>6</sup> =	4.851
NFA	overall	8.943	0.673	11.153	6.923	N =	1107
	between		0.650	10.967	7.126	n =	230
	within		0.185	10.094	7.667	T-bar =	4.813
NFA/TA	overall	0.358	0.257	0.967	0.001	N =	1107
	between		0.249	0.923	0.003	n =	230
	within		0.071	0.887	-0.189	T-bar =	4.813
S/NFA	overall	4.886	10.044	126.866	-5.132	N =	1104
	between		9.317	84.042	0.079	n =	230
	within		4.582	47.711	-74.707	T-bar =	4.8
PF/TA	overall	0.029	0.089	0.364	-1.108	N =	1106
	between		0.0633	0.295	-0.310	n =	230
	within		0.0631	0.363	-0.870	T-bar =	4.808

**Notes:**<sup>1</sup> Overall means combined between and within variation;<sup>2</sup> Between means across firms;<sup>3</sup> Within means across years;<sup>4</sup> N=total number of observations;<sup>5</sup> n= number of firms;<sup>6</sup> T-bar=average number of years of data available for the firms included in the sample.

**Table 2: Baseline Regressions**

Dependent variable is (LTD/TD)						
	OLS	Fixed	Random	IV(1)	IV(2)	GMM
	(1)	Effects	Effects	(4)	+ FE	(6)
	(1)	(2)	(3)	(4)	(5)	(6)
NFA (size)	0.217 (16.68)**	0.194 (5.31)**	0.21 (10.61)**	0.215 (14.15)**	0.286 (0.67)	0.236 (3.10)**
NFA/TA (tangibility)	-0.086 (-2.46)*	-0.291 (-4.05)**	-0.177 (-3.84)**	-0.034 (-0.74)	-2.406 (-2.04)*	-0.421 (-2.96)**
S/NFA (sales)	-0.003 (-1.67)	-0.003 (-1.6)	-0.003 (-1.75)	-0.003 (-0.86)	0.03 (0.3)	0.001 (0.42)
PF/TA (profits)	-0.053 (-0.71)	-0.181 (-2.50)*	-0.129 (-1.94)	0.047 (-0.35)	-1.052 (-1.78)	-0.123 (-1.11)
BONDS (access)	0.234 (6.01)**	0.16 (5.12)**	0.171 (5.65)**	0.199 (4.44)**	0.06 (0.62)	0.082 (1.69)
AFLI (fin. liberalization)	-0.294 (-0.9)	-0.356 (-1.45)	-0.381 (-1.69)	0.533 (0.58)	0.176 (0.15)	1.323 (1.99)*
FD (fin. development)	0.038 (0.66)	0.025 (0.61)	0.022 (0.57)	0.295 (0.97)	0.304 (0.45)	0.733 (2.69)**
Lagged (LTD/TD)						0.598 (5.11)**
R-Squared	0.34	0.78		0.32	0.65	
F-Statistic	63.38	12.87		43.61	4.33	
Chi-Squared Statistic			205.7			47.38

Notes:

*t*-statistics in parentheses below coefficients. (\*\*) significant at 1%; (\*) significant at 5%  
 The variable EQUITY was dropped due to multicollinearity problems.

**Table 3: Endogeneity of Access Variables**

Dependent variable is (LTD/TD)						
	OLS	Fixed Effects	Random Effects	IV	IV w/FE	GMM
NFA (size)	0.209 (15.93)**	0.199 (5.35)**	0.208 (10.30)**	0.202 (13.17)**	0.324 (-0.82)	0.254 (3.37)**
NFA/TA (tangibility)	-0.071 (-2.03)*	-0.288 (-3.96)**	-0.166 (-3.58)**	-0.013 (-0.28)	-2.24 (-2.21)*	-0.421 (-2.99)**
PF/TA (profits)	-0.032 (-0.43)	-0.169 (-2.30)*	-0.108 (-1.61)	0.047 (0.36)	-0.982 (-1.69)	-0.137 (-1.23)
BONDS (access)	0.008 (2.84)**	0.008 (3.94)**	0.008 (3.91)**	0.006 (1.89)	0.001 (0.11)	0.005 (2.03)*
EQUITY (access)	0.118 (3.72)**	0.017 (0.4)	0.058 (1.67)	0.13 (3.97)**	-0.073 (-0.4)	-0.177 (-2.27)*
AFLI (fin. liberalization)	-0.361 (-1.11)	-0.355 (-1.43)	-0.385 (-1.69)	0.585 (-0.64)	0.173 (-0.15)	1.386 (2.09)*
FD (fin. development)	0.024 (0.42)	0.019 (0.46)	0.015 (0.39)	0.331 (1.09)	0.332 (0.54)	0.775 (2.85)**
Lagged (LTD/TD)						0.586 (5.14)**
R-Squared	0.34	0.78		0.33	0.7	
F-Statistic	52.07	10.34		40.35	4.96	
Chi-Squared statistic			201.51			48.17

Notes:

*t*-statistics in parentheses below coefficients. (\*\*) significant at 1%; (\*) significant at 5%

The variable S/NFA was consistently insignificant and was therefore dropped.