

# 14 Financial liberalization and corporate debt maturity in Thailand, 1993–97

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## 1 Introduction

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

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

18 In this paper, we examine the effects of financial liberalization on corporate  
19 debt maturity in Thailand, where the crisis began, and we consider whether the  
20 experience of South Korea generalizes to other countries. In particular, we consider  
21 whether Thai corporations increased their reliance on short-term debt in the run-up  
22 to the 1997 crisis, and whether this reliance resulted from financial liberalization  
23 or from other factors driving the maturity of corporate debt. We document the  
24 evolution of corporate debt maturity in Thailand during two different stages  
25 of international financial integration: early-stage financial globalization during  
26 1993–94, and rapid financial globalization during 1995–97.

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

1 **Debt maturity and Thailand's crisis**

2 A number of studies have argued that debt maturity played a key role in the Asian  
3 financial crisis. Dadush *et al.* (2000) point out that half of all new loans from  
4 international banks in the period preceding the crisis had maturities of one year or  
5 less, and the volume of short-term debt grew fastest in East Asia. In Thailand short-  
6 term debt rose to around 120 per cent of reserves (a figure that pales compared  
7 to the Korean figure of 200 per cent), and since short-term borrowing was pro-  
8 cyclical with the macroeconomy, the reversal in the balance of payments that came  
9 with the crisis was thus dramatic.

10 Alba *et al.* (1999) argued that Thailand's financial crisis was fundamentally  
11 caused by private debt, and that financial liberalization was the main reason  
12 for this. Between 1990 and 1996, private external debt doubled as a share of  
13 Thailand's GDP, though the overall share of this debt that was short-term remained  
14 relatively stable, and the most dramatic expansion of international borrowing  
15 was by Thai banks and offshore institutions (i.e., the Bangkok International  
16 Banking Facility). Finance companies in particular began to borrow most of  
17 their funds with maturities of three months or less, and found their portfolio  
18 maturity increasingly mismatched. Financial liberalization, they argue, led to this  
19 borrowing because it increased competition and reduced profit margins, thereby  
20 increasing incentives to practice unsound banking behaviour in the absence of  
21 adequate prudential regulation. Financial liberalization was also accompanied by  
22 an increased international openness, so Thai firms had greater access to unhedged  
23 funds denominated in foreign currency, which made it susceptible to exchange  
24 rate risk.

25 What determines the maturity structure of corporate debt elsewhere? While  
26 much of the literature<sup>3</sup> on corporate debt maturity has concentrated on analyzing  
27 its effects on the value of the firm, there have been a number of studies on the  
28 external determinants of debt maturity and some of this literature has focused on  
29 international case studies and comparisons. Barclay and Smith (1995), for example,  
30 find evidence that larger firms in the US tend to have longer debt maturities, along  
31 with those firms under more regulation, while firms with more growth opportunities  
32 rely on shorter maturities, perhaps because of information asymmetries. These  
33 basic findings have been confirmed by several studies, including Stohs and Mauer  
34 (1996), Cunat (1999), Ozkan (2000; 2002) for a sample of British firms, Heyman  
35 *et al.* (2003) for a sample of small Belgian firms and Chen *et al.* (1999) for firms  
36 in Singapore.

37 Demirgüç-Kunt and Maksimovic (1999) examined the capital structure of firms  
38 in 30 developing and developed countries during the period 1980–1991 and found  
39 that the presence of well-developed stock markets was an important determinant  
40 of the positive relationship between firm size and debt maturity, since small firms  
41 in countries where bank lending was the dominant form of finance tended to use  
42 relatively less short-term debt. Niskanen and Niskanen (2001) found that for a  
43 sample of Finnish firms that bank ownership of stock helped solve the contracting  
44 problem, so smaller firms with more bank ownership and growth opportunities

1 were able to get longer maturities on their debts. Similarly, Datta *et al.* (2005)  
2 found that more managerial stock ownership led to shorter debt maturities.

3 Other studies have focused on the effects of specific policies or macroeconomic  
4 variables on the maturity of corporate debt, including, prominently, the impact of  
5 inflation on the shortening in the maturity structure of corporate debt (e.g. Klein  
6 1975; Aarstol, 2000; Guerrero 2004 ;2007b). Miller (1997) found evidence that  
7 political instability and polarization have an important role in creating inflation  
8 uncertainty and thus shorter debt maturities.

9 Closer to this paper are studies by Schmukler and Vesperoni (2001; 2006) and  
10 Guerrero (2007a). Schmukler and Vesperoni (2001; 2006) conduct a cross-country  
11 study of the effects of globalization on firms' financing choices in an unbalanced  
12 panel of firms in eight Latin American and East Asian countries. Interestingly,  
13 Thailand is one of the countries in their study, though they did not derive country-  
14 specific conclusions and they were mainly interested in studying the effects of  
15 financial crisis on firms' financing choices. Guerrero (2007a) finds a reduction  
16 in corporate debt maturity prior to the Asian financial crisis for publicly-traded  
17 firms in South Korea, and traces back the origin of the phenomenon to the early  
18 stages of financial globalization. Finally, the debt maturity of Thai corporations  
19 in the run-up to the financial crisis has been studied by Wiwattanakantang *et al.*  
20 (2003), who found that firms with close relationships with banks were more likely  
21 to borrow with longer maturities.

## 22 **The effects of liberalization on corporate** 23 **debt maturity in Thailand**

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

30 In this paper, we examine the maturity structure of corporate debt in Thailand,  
31 and how it responded to globalization, as measured by proxies for financial  
32 liberalization, increased access to international bond and equity markets, and the  
33 increase in the development of the domestic equity and financial markets. This  
34 paper purposefully excludes the period after 1997, because the focus is on the  
35 effects of globalization on corporate debt maturity in the years that lead to the  
36 crisis. Our data is a subset of the dataset used in Schmukler and Vesperoni (2001;  
37 2006), but given the differences in goals and scope between this paper and theirs,  
38 we use a balanced panel to be able track the evolution of the same firms during  
39 the run-up to the crisis.

### 40 ***Definition of variables***

41 The dependent variable in all our regressions is the ratio of long-term debt to  
42 total debt (LTD/TD). Following the recent empirical literature that studies firms'

1 financing decisions (e.g. Demirgüç-Kunt and Maksimovic 1999; Booth *et al.* 2001;  
 2 Schmukler and Vesperoni 2001; 2006) the vector of observable firm characteristics  
 3 includes five variables. The first variable is a proxy for the size of the firm, the  
 4 logarithm of a firm's net fixed assets (NFA). The second variable is an indicator  
 5 of asset tangibility, the ratio of net fixed assets to total assets (NFA/TA). The third  
 6 variable, an indicator of firms' revenues, is the ratio of net sales to net fixed assets  
 7 (S/NFA). The fourth variable proxies the profitability of firms with the ratio of  
 8 profits to total assets (PF/TA). Descriptive statistics for these five variables are  
 9 shown in Table 14.1.

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

20 Two alternative measures to proxy for financial liberalization are used. First, we  
 21 use the arithmetic average of four individual financial liberalization indices (AFLI)  
 22 that capture the degrees of liberalization of interest rates caps, the degree of control

*Table 14.1* Summary statistics for microeconomic variables

<i>Variables</i>		<i>Mean</i>	<i>Std. Dev.</i>	<i>Max.</i>	<i>Min.</i>	<i># of observations</i>
LTD/TD	overall <sup>a</sup>	0.264	0.241	0.929	-0.035	N <sup>d</sup> = 883
	between <sup>b</sup>		0.209	0.788	0.000	n <sup>e</sup> = 182
	within <sup>c</sup>		0.119	0.777	-0.314	T-bar <sup>f</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>a</sup> Overall means combined between and within variation. <sup>b</sup> Between means across firms. <sup>c</sup> Within means across years. <sup>d</sup> N = total number of observations. <sup>e</sup> n = number of firms. <sup>f</sup> T-bar = average number of years of data available for the firms included in the sample.

1 of private credit by the central bank, the level of marginal and average reserve  
 2 requirements, and restrictions to both capital inflows and capital outflows. Each of  
 3 the individual indices takes three possible values (1, 2, or 3), where 3 represents  
 4 full financial liberalization, 2 partial financial repression, and 1 full financial  
 5 repression. The information to construct these indices was taken from Kaminsky  
 6 and Schmukler (2002). This multidimensional index of financial liberalization is  
 7 the reported in the tables below. We also considered a dummy variable that follows  
 8 the stock market liberalization dates reported in Bekaert and Harvey (2000), but  
 9 the results were unchanged.

10 To control for the effects of rapid development of the domestic equity and credit  
 11 markets on the maturity of corporate debt, we follow Beck *et al.* (2000) and proxy  
 12 for the degree of financial development (FD) with the sum of both stock market  
 13 capitalization and the outstanding liabilities of the banking sector, expressed as a  
 14 share of GDP.

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

#### 20 ***Econometric estimations and baseline results***

21 We estimate six different alternative specifications

- 22 1 ordinary least squares;
- 23 2 firm-specific fixed effects;
- 24 3 random effects;
- 25 4 instrumental variables, with the right-hand-side regressors instrumented using  
 26 first lags;
- 27 5 fixed effects and instrumental variables, using both the first and second lags  
 28 as instruments; and
- 29 6 the Arellano-Bond (1993) specification, using a dynamic panel data General-  
 30 ized Method of Moments procedure that controls both for the potential  
 31 endogeneity of the microeconomic variables used as right-hand-side regres-  
 32 sors, as well as for the potential time-series problems of the left-hand-side  
 33 endogenous variable.

34 Results for these baseline regressions are shown in Table 14.2. All regressions  
 35 include an unreported constant term.

36 The OLS estimate provides the basic multivariate correlation embedded in the  
 37 data, and these results are shown in column 1 of Table 14.2. However, OLS  
 38 estimates are usually criticized when used with individual or firm-level data  
 39 because they do not control for unobservable characteristics that could be biasing  
 40 the estimated coefficients or introducing a potential reverse causation problem.  
 41 To control for some of these unobservable characteristics, the firm-specific

Table 14.2 Baseline regressions

	<i>OLS</i>	<i>Fixed effects</i>	<i>Random effects</i>	<i>IV(1)</i>	<i>IV(2)</i> + <i>FE</i>	<i>GMM</i>
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Dependent variable is (LTD/TD)</i>						
NFA (size)	0.217 (16.68)**	0.194 (5.31)**	0.210 (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 (-1.60)	-0.003 (-1.75)	-0.003 (-0.86)	0.03 (0.30)	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)**	0.160 (5.12)**	0.171 (5.65)**	0.199 (4.44)**	0.060 (0.62)	0.082 (1.69)
AFLI (fin. liberalization)	-0.294 (-0.90)	-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)**
$R^2$	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

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

1 Fixed Effects estimation procedure is estimated, and the results are shown  
 2 in column 2. Because the fixed-effects estimates disregard all the cross-sectional  
 3 variation, we also include an alternative (static) panel data technique using random  
 4 effects estimates, with a weighted average of the purely cross-sectional estimate  
 5 and the fixed effects estimates. These estimates are shown in column 3.

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

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

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

6 As Table 14.2 shows, the most significant microeconomic determinants of  
7 corporate debt maturity are the firm's size (NFA) and the tangibility of its  
8 assets (NFA/TA). Consistent with the literature, we find that larger firms hold  
9 longer debts. The negative sign for the tangibility of assets implies that more  
10 tangible assets are associated with shorter maturity; this result is consistent across  
11 specifications and stands in opposition to what is usually observed in other case  
12 studies (in South Korea, for instance, as reported in Guerrero 2007a). No other  
13 microeconomic determinant of corporate debt is statistically significant for all  
14 or most econometric specifications, and this result is also different from results  
15 previously found for other emerging economies (e.g. Schmukler and Vesperoni,  
16 2001, or Guerrero, 2004). The sales ratio is insignificant, and the effect of  
17 profitability is insignificant in all cases but the fixed effect model, where the effect  
18 on maturity is negative.

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

25 The next proxy for financial integration to the international markets is AFLI,  
26 the multidimensional index of financial liberalization. This variable is insignificant  
27 in all specifications but the last, where it is positive. In the GMM specification,  
28 the index for financial liberalization has a lengthening effect in corporate debt  
29 maturity, a finding that contradicts the ones in Schmukler and Vesperoni (2001;  
30 2006) and Guerrero (2007a). This result suggests that it is not so clear that financial  
31 liberalization led to a shortening of debt maturity, at least for listed corporations  
32 in Thailand, and it may in fact have had the reverse effect.

33 Finally, the FD variable that proxies for the degree of financial development  
34 of the domestic financial sector displays a similar pattern to AFLI, in that that  
35 it is insignificant in all but the last and most relevant specification, the only  
36 one that explicitly controls for potential dynamic problems; the indicator for  
37 financial development displays a significant degree of inertia, as does the dependent  
38 variable, so a dynamic specification is probably the most appropriate. In the  
39 GMM specification, FD displays a strong and significant lengthening effect  
40 on the maturity of corporate debt. Therefore, the overall effect of increased  
41 financial integration during the early stages of globalization is probably to lengthen  
42 the maturity of corporate debt, a finding that is in contrast to those reported  
43 previously by Schmukler and Vesperoni (2001; 2006), for an unbalanced panel of  
44 East Asian firms during the period 1980–99, and Guerrero (2007a), for the case of  
45 South Korea at an early stage of financial globalization.

1 ***Robustness of the access measurements***

2 Given the collinearity problem affecting the dummy variables BONDS and  
3 EQUITY for access to international capital markets in the regressions reported  
4 above, we next consider an alternative proxy for the access variables. Specifically,  
5 we combine the two access variables into one, by measuring the number of times  
6 that firms had access to either the international bonds or equity markets. The  
7 results are not very different from the ones displayed in Table 14.2, and are  
8 not shown separately, but the combined access variable becomes statistically and  
9 economically insignificant in all specifications.

10 A legitimate concern with the baseline regressions shown in Table 14.2 and  
11 described above is related to the potential endogeneity bias introduced by the  
12 access variables. In particular, if the firms that had access to international capital  
13 markets are the same ones that also had access to long-term debt, the estimate  
14 of the effect of the access variable would be biased. To address those potential  
15 sources of trouble, two strategies were followed, along the lines of recent literature  
16 (Schmukler and Vesperoni 2006; Schmukler and Vesperoni 2001; Ozkan, 2000).  
17 First, we use first lags of the same proxies used in Table 14.2, under the  
18 assumption that these lags were predetermined variables. Second, we follow a  
19 twofold procedure in which we use lags of the same variable as instruments. For  
20 access to equity markets, following both Schmukler and Vesperoni (2006) and  
21 Ozkan (2000), we use two lags as instruments. For access to bonds markets,  
22 we construct an instrument that indicates whether capital markets were open.  
23 This instrument, first proposed by Schmukler and Vesperoni (2001), takes a  
24 value of one if two conditions are fulfilled: (i) At least one firm had access  
25 to international bonds markets during that period; and (ii) the firm was able to  
26 issue international bonds at least once during the sample period. Otherwise, the  
27 instrument takes a value of zero. The results provided by the two strategies are  
28 shown in Table 14.3.

29 Results are similar to the ones presented in Table 14.2 before. First, larger firms,  
30 and those with less tangible assets, have longer debt maturities. The sales variable  
31 remained insignificant in all cases and was dropped, while profit rates are now  
32 also insignificant in all cases. Access to the international bonds market continues  
33 to have had a positive effect on maturity in four of the specifications, though not the  
34 same four cases. Access to international equity markets has a mixed effect, positive  
35 in the OLS and IV specifications, negative in the dynamic GMM specification, and  
36 insignificant in the other three. Financial liberalization and the degree of financial  
37 development both continue to conform to the results in Table 14.2, with both having  
38 a significant and positive effect on maturity in only the GMM specification.

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

Table 14.3 Endogeneity of access variables

	<i>OLS</i>	<i>Fixed effects</i>	<i>Random effects</i>	<i>IV</i>	<i>IV w/FE</i>	<i>GMM</i>
<i>Dependent variable is (LTD/TD)</i>						
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)	-2.240 (-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 (0.40)	0.058 (1.67)	0.130 (3.97)**	-0.073 (-0.40)	-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

Note: *t*-statistics in parentheses below coefficients. (\*\*) significant at 1%; (\*) significant at 5%. The variable S/NFA was consistently insignificant and was therefore dropped.

## 1 Conclusion

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

1 debt instruments from international markets, but it is not so clear that Thailand's  
2 corporations did the same.

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