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THAILAND

Selected Issues

Prepared by Shekhar Aiyar, Masahiro Hori, Ivan Tchakarov (all APD),
and Jeanne Gobat (MCM)

Approved by the Asia and Pacific Department

February 2, 2007

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I. Overview

The three papers presented here examine investment in Thailand—from both a regional and country-specific perspective—and recent developments and outstanding challenges in the financial sector. In order to raise growth to potential over the medium term, Thailand needs to broaden the sources of growth away from the external sector and toward domestic demand, especially toward public and private investment. Further strengthening the financial sector would also enhance medium-term growth prospects.

Low investment following the 1997 financial crisis is not restricted to Thailand, but is part of a wider regional pattern. Chapter II documents that the post-crisis Asian investment slump is unusually prolonged and deep compared with other crisis episodes. Cross-country regressions using a panel of 85 countries establish that the Asian investment slump is only partly accounted for by overinvestment in the years preceding the crisis. Three alternative explanations are found to be broadly consistent with the empirical evidence: a riskier post-crisis environment, corporate and financial sector weaknesses, and a sluggish nontradable goods sector.

The public sector needs to play a leading role in investment over the medium term, both because of its own contribution to growth and because of its catalytic role in crowding in private sector investment. Chapter III analyzes the opportunities and challenges of implementing large-scale infrastructure investments by the Thai public sector (the so-called "megaprojects"). It argues that given the need to upgrade infrastructure and relieve transportation bottlenecks, and given the fiscal space provided by several years of public sector surpluses and low public debt, efficiently executed megaprojects are amply justified. The chapter also examines country experiences with Public-Private Partnerships (PPPs), which represent one way of using public infrastructure investment to crowd in the private sector.

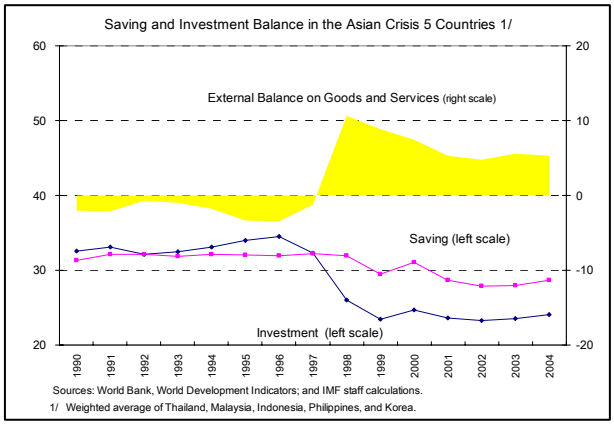
A decade after the Asian crisis, Thailand's financial sector has been significantly strengthened, but further reforms are needed to address remaining vulnerabilities, improve regulatory oversight, and broaden and deepen capital markets. Chapter IV provides an assessment of the progress made to date, including improvements in the efficiency and resilience of financial markets; and operational restructuring, better risk management, and lower NPLs in the banking system. Core challenges going forward include reducing distressed assets in banks, and legal reforms to further strengthen the financial system. Such reforms would enhance medium-term growth by easing the transformation of savings—both domestic and international—into domestic investment.

II. Investment Recovery from Financial Crises: A View from Cross-Country Experiences[1]

Lower investment in emerging Asia compared with the pre-crisis period is a puzzle. This paper examines the post-crisis behavior of investment in Asia. Based on cross-country historical experiences we argue, first, that the investment slump after the Asian crisis is exceptional. Second, the paper shows that the investment slump can be characterized as a reaction to pre-crisis overinvestment. However, the overinvestment cannot be a full explanation of the still low investment. Third, the paper examines reasons that might account for the slow investment recovery. Explanations discussed include: (i) a riskier investment environment, (ii) weaknesses in the financial and corporate sectors, and (iii) sluggish nontradable sectors. We show these explanations are loosely consistent with the observed patterns of investment, though none of them are strong enough to fully explain the slow investment recovery on their own.

A. Introduction

1. **Since the 1997 financial crisis, the saving-investment balance in emerging Asian countries has shifted from a deficit to a significant surplus.** While there has been an active debate over whether the large surpluses in emerging Asia reflect an "investment drought" or a "saving glut," the data point to the former. In contrast to the relatively stable savings, investment declined almost simultaneously with the crisis and has only partially recovered. Thus, the limited contribution of investment to output growth and the resulting large current account surpluses have focused much interest on the factors driving the recent stagnation of investment in Asia.[2]



2. **Although the roots of the investment slump are complex and may differ across countries, the simultaneous investment decline in Asia could have regional explanations.** Using a cross-country panel of 85 countries, this paper attempts to study the effects of financial crises on investment. Like other recent studies (e.g., WEO, 2005), the investment regression in this paper is not very successful in tracking recent developments,

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[1] Prepared by Masahiro Hori. Martin Schindler kindly provided his data, which constitute the core of the dataset used in this paper.

[2] WEO (2005), Asia and Pacific REO (2005, 2006a, 2006b), and Dell'Ariccia and Eskesen (2006) are examples of such studies by Fund staff. Millikamas, Thaicharoen, and Rodpengsangkaha (2003) focused on stagnant investment in Thailand.

especially those after the Asian crisis. However, the deviations from the standard model themselves may contain important messages, as described in the following sections. By examining the residuals from the investment regressions, this paper tries to explain the post-crisis investment slump and propose policies to remedy the situation.

3. **Based on cross-country historical experiences, this paper, first, argues that the contraction of investment after the Asian crisis is exceptional.** Pre-crisis investment was far beyond the level suggested by economic fundamentals, and the post-crisis investment fall has been exceptionally severe and prolonged. Excluding the Asian crisis episodes in 1997, only 9 out of more than 100 independent currency crisis events identified in this paper could be categorized as *investment slump crises* like the Asian crisis.

4. **Then, by comparing the investment slump crisis with the others, the paper shows that the investment slump can be broadly characterized as a reaction to pre-crisis overinvestment.** In general, there was rapid credit growth during the period leading up to the investment slump crisis, allowing economies to expand beyond fundamentals. Overinvestment took place largely due to overtly optimistic market expectations. Therefore, we cannot expect investment in emerging Asia to recover its pre-crisis level. On the other hand, we might well expect investment to pick up eventually, so long as the current investment is still below its normal level.

5. **Finally, this paper turns to why investment has yet to recover, by focusing on five crisis-affected Asian countries.**[3] A riskier investment environment, weaknesses in the financial and corporate sector, and sluggish nontradable sectors are the likely factors that are examined. We show that explanations based on these three factors are loosely consistent with the observed patterns of investment in the Asian-crisis countries, though none of them are strong enough to explain all the slow investment recoveries on their own.

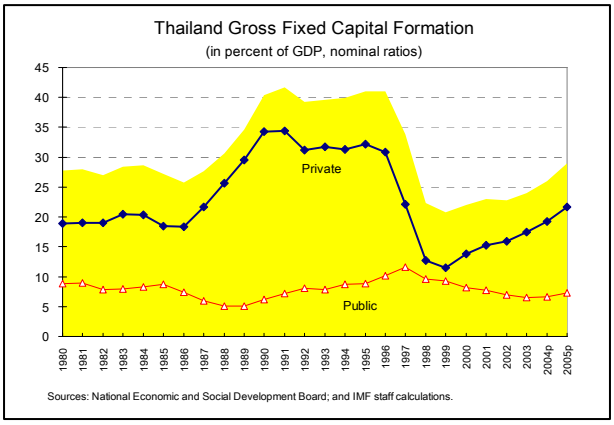
6. **The paper is organized as follows:** Section B briefly looks back at investment developments in Thailand before and after the Asian crisis, and argues that the after-crisis investment slump is a regional phenomenon that warrants cross-country study. Section C runs cross-country investment regressions as references to evaluate the "right" level of investment. Using deviations from the regressions as our source of information, we try to highlight the features of the *investment slump crisis* including the Asian crisis. Section D turns to the causes of the deviations, and Section E concludes.

B. Background Facts

7. **The investment decline in Thailand since the Asian crisis has been sizable and prolonged.** Investment dropped from over 40 percent of GDP during 1990–96 to about

[3] These are Indonesia, Korea, Malaysia, Philippines, and Thailand. In the following text, we refer to them as the Asian-crisis countries.

20 percent in 1999. While investment has grown since then, it remains well below pre-crisis levels and only regained its pre-1990 average (29 percent of GDP) in 2005, eight years after from the crisis. While the initial drop in investment was largely due to a decline in private investment, public investment has contributed to the slowness of recovery. Despite the very negative contribution of investment during the crisis, the contribution of investment to output recovery after 1999 was smaller than that of a typical expansion.

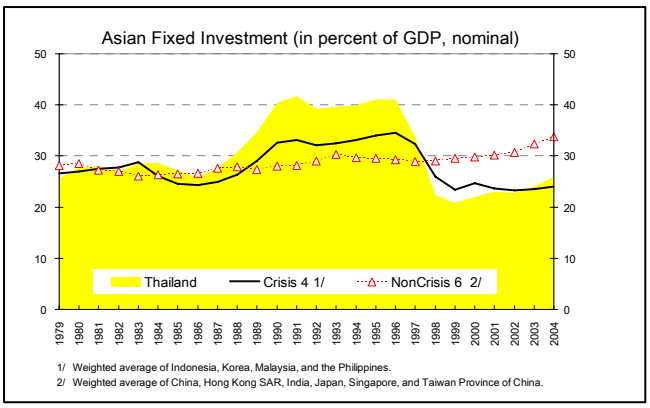


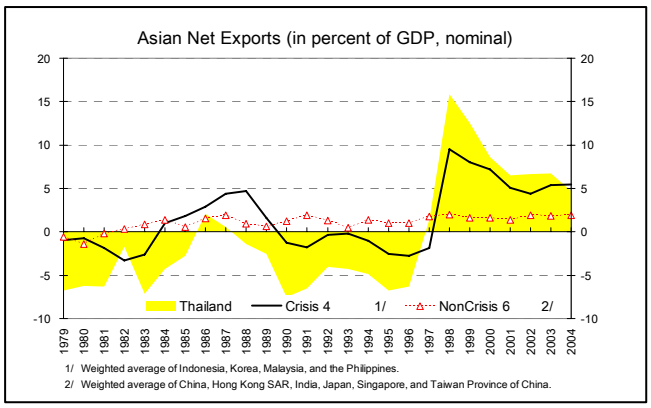
Relative Contribution to Real Output Growth 1/

	Consumption	Fixed Investment	Net Export and Others
Typical Expansion 2/	0.70	0.48	-0.18
1999–2005	0.69	0.26	0.06
Typical Recession 3/	0.68	0.16	0.17
1997–98 4/	-0.64	-3.90	3.54

1/ Unweighted average.
2/ Average of three expansionary cycles: 1966–69, 1976–78, and 1987–96.
3/ Average of two contractionary cycles: 1970–75, and 1979–86.
4/ Contributions add up to -1 to reflect negative output growth during this period.

8. **The investment slump after the crisis had an international dimension.** For example, comparing 1990–96 with 2000–04, investment declined by between 4 and 17 percentage points of GDP in the Asian-crisis countries. On the other hand, effects on the other six Asian countries/economies were relatively minor at least in the 1990s.[4] Given relatively stable saving rates in the region, albeit at higher levels than in other regions, the collapse of investment and subsequent sluggish investment recovery led to a sustained external surplus in the crisis countries.





[4] While we observe rapid investment declines in Hong Kong SAR, Singapore, and Taiwan Province of China in the 2000s, they are not directly related to the Asian crisis, and their impact on the world economy is offset by the recent investment boom in China as seen in the noncrisis country weighted average series in the figure above.

9. **The broad-based decline in investment relative to GDP in the Asian-crisis countries warrants a regional study on the effects of financial crises on investment.** To be sure, the extent and nature of the investment slump, as well as factors underlying it, may differ across countries. However, the drastic turn of events after the crisis and the observed impact, which was centered on the crisis-affected countries, suggest that there are some underlying factors that were affected by the crisis and caused the emerging Asia's investment slump. In the next section, we adopt a cross-country historical perspective to find out what factors may explain the investment slump.

C. Econometric Evaluation

Reference regressions as a measure of the normal investment

10. **Though controversial, projections from econometric models provide us with a yardstick to determine whether investment is now at the "right" level.** While current investment rates in emerging Asia are apparently lower than pre-crisis levels, this might just reflect a pruning of pre-crisis overinvestment. At least investment has been, and still is, higher than that in other regions. However, recent empirical studies that tackled the question of the "right" level have generally found that recent investment in emerging Asia (excluding China) is lower than predicted by fundamental factors.[5] Drawing on these earlier studies, we run cross-country regressions of the determinants of the ratio of investment to nominal GDP, to obtain a measure of normal investment.

11. **The specification broadly follows that by Barro and Lee (2003), which used lagged GDP, government size, trade openness, demographics, and a democracy index as control variables.** We supplement it with other variables—real per capita GDP growth, population growth, inflation rate, share of agriculture/industry in GDP, dependency ratio, etc.—that are likely to account for the normal level of investment. We adopt specifications without lagged dependent variables and generalized 2 stage least squares (G2SLS) random-effects estimations[6] so that we may use projections (fitted values) from the regressions as our reference investment.[7]

12. **The sample used in our study consists of 85 countries over the period 1975–2004.** Data series were taken from a variety of sources, including the World Bank's *World*

[5] See Chinn and Ito (2005) and WEO (2005), for example.

[6] We also run regressions with fixed effects, though we do not report them because of limited space, as they produced similar results.

[7] In the recent literature, it may be more fashionable to run generalized method of moments (GMM) dynamic panel regressions to estimate investment equations; however, here we adopt a specification without lagged-dependent variable to obtain fitted values as "normal investment." Dynamic regressions, with which we calculate normal investment as the ratio of fitted values over one minus the coefficient on the lagged-dependent variable, may be used to confirm the robustness of our findings.

Development Indicators, the IMF's *International Financial Statistics* and the *World Economic Outlook*, and national authorities. Countries were selected based on data availability, although we excluded some small countries, for which data appeared unreliable, from our sample.[8]

13. **Our results confirm the findings by earlier studies, such as WEO (2005) and Barro and Lee (2003).** We tried four combinations of specification by including and excluding two key independent variables, that is, public investment ratio and domestic saving ratio. The results are robust irrespective of the combinations (Table 1). The initial level of per capita GDP negatively affects the investment ratio. Higher output/population growth boosts investment significantly. Inflation and trade openness are positively related to investment, while the increases in dependency ratio result in lower investment regardless of age. The investment ratio is affected also by industrial structures, though they are not always statistically significant. The nonlinear relationship between democracy and investment, as found by Barro and Lee, is confirmed. Significant coefficients on the public investment, roughly 0.5, indicate that public investment is only partially offset by adjustments in private behavior. Significant positive coefficients on saving ratio reconfirm the strong relationship between saving and investment, which was originally reported by Feldstein and Horioka (1980).

14. **As the regressions above do not control for the impact of financial crises, any effect of crises would show up as deviations from the estimated models.** Obviously, the most straightforward and conventional way to evaluate the impact is to use crisis dummy variables, which take on the value *one* if a crisis occurred for each country in that year, in the regressions.[9] Table 2 reports the coefficients on dummy variables, which we obtained by adding the currency and banking crisis dummies to our system.[10] To capture persistent impact, we included crisis dummies with lags up to five years. Estimated coefficients show that a currency crisis is significantly associated with a decrease in the investment ratio by about 1 percentage point, and the negative impact persists at least for a few years. A banking crisis is also associated with a 1 percent reduction in the investment ratio, though the impact eases up relatively quickly.

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[8] We also ran the same regressions using the sample of only 46 industrial and emerging market countries that were included in the WEO (2005) regressions to exclude possible contamination from unreliable data; however, we do not report the results since the qualitative nature of our analyses is not very much affected.

[9] Identification of financial crises is crucial for our analyses. We identify financial crises, both currency and banking, by relying on previous studies. Data on currency crisis until 2000 are from Gupta, Mishra, and Sahay (2003). We extended our currency crisis data until 2004 by applying definitions by Frankel and Rose (1996) and Melesi-Ferretti and Razin (1998). The source of banking crisis data is Demirgüc-Kunt and Detragiache (2005).

[10] We omit the coefficients on other independent variables, since they are not much different from those in our reference models without the crisis dummies in Table 1.

Table 1. Investment Ratio Reference Models: Panel Regression

(G2SLS random-effects IV regression)

Investment Ratio (Percent of GDP)	Reference Models (85 Countries/Economies)			
	[1]	[2]	[3]	[4]
Real GDP per capita based on PPP	-0.0001 ***	-0.0001 ***	-0.0003 ***	-0.0003 ***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Real per capita GDP growth (average of the past 5 years)	0.785 ***	0.733 ***	0.572 ***	0.528 ***
	(0.046)	(0.047)	(0.048)	(0.047)
Population growth (average of the past 5 years)	2.239 ***	2.124 ***	1.880 ***	1.803 ***
	(0.262)	(0.256)	(0.250)	(0.241)
Inflation rate (average of the past 3 years)	0.001 ***	0.001 ***	0.001 ***	0.001 ***
	(0.000)	(0.000)	(0.000)	(0.000)
Government consumption ratio (percent of GDP, average of the past 3 years)	-0.070 **	-0.111 ***	0.019	-0.029
	(0.033)	(0.032)	(0.032)	(0.030)
Trade openness: (Ex + Im)/GDP (average of the past 3 years)	0.018 ***	0.010 *	0.012 **	0.003
	(0.006)	(0.005)	(0.005)	(0.005)
Agriculture value added (percent of GDP) (average of the past 3 years)	-0.039	-0.022	-0.048 **	-0.036
	(0.026)	(0.025)	(0.025)	(0.023)
Industry value added (percent of GDP) (average of the past 3 years)	0.079 ***	0.096 ***	-0.032	-0.015
	(0.023)	(0.022)	(0.024)	(0.023)
Population ages 65 and above (percent of total)	-0.477 ***	-0.466 ***	-0.255 **	-0.203 *
	(0.124)	(0.116)	(0.117)	(0.108)
Population ages 0–14 (percent of total)	-0.520 ***	-0.479 ***	-0.507 ***	-0.461 ***
	(0.070)	(0.068)	(0.067)	(0.064)
Log (life expectancy)	2.882 **	5.624 ***	2.815 **	4.635 ***
	(1.440)	(1.794)	(1.360)	(1.649)
Log (total fertility rate)	0.433	-0.145	2.988 ***	2.589 **
	(1.113)	(1.085)	(1.075)	(1.035)
Democracy index	0.414 ***	0.403 ***	0.449 ***	0.441 ***
	(0.146)	(0.139)	(0.139)	(0.130)
Democracy index squared	-0.043 **	-0.037 **	-0.038 **	-0.033 **
	(0.017)	(0.016)	(0.016)	(0.015)
Relative price of oil (2000=1.0) x oil exporting country dummy	-0.381	-0.625 **	-0.567 **	-0.816 ***
	(0.285)	(0.272)	(0.270)	(0.254)
Relative price of oil (2000=1.0) x oil importing country dummy	0.109	0.062	0.280	0.243
	(0.282)	(0.289)	(0.268)	(0.271)
Public fixed capital formation Ratio (percent of GDP)		0.512 ***		0.463 ***
		(0.046)		(0.042)
Domestic saving ratio			0.319 ***	0.335 ***
			(0.026)	(0.025)
R-sq: within	0.310	0.386	0.379	0.462
between	0.624	0.668	0.662	0.701
overall	0.483	0.541	0.539	0.594
Sigma_u	2.733	2.340	2.462	2.000
Sigma_e	3.694	3.479	3.508	3.264
Rho	0.354	0.311	0.330	0.273
Hausman test: difference not systematic	35.170	48.160	46.830	63.280 **
Number of observations	2201	2136	2201	2136
Number of countries	85	85	85	85

Notes:

1. Numbers in parentheses are standard errors. Significance level are * 10%; ** 5%; *** 1%.
2. All regressions are estimated by G2SLS random-effects IV regression and include time dummies and a constant.

Table 2. Coefficients on Financial Crisis Dummies in the Reference Models
(G2SLS random-effects IV regression)

	Reference Model Sample (85 Countries/Economies)			
	[1]	[2]	[3]	[4]
Currency crisis dummy	-0.205	-0.387	-0.246	-0.403
	(0.357)	(0.337)	(0.366)	(0.347)
Currency crisis dummy (1 year lag)	-0.815 **	-1.211 ***	-0.810 **	-1.190 ***
	(0.337)	(0.320)	(0.346)	(0.330)
Currency crisis dummy (2 year lags)	-0.932 ***	-1.158 ***	-0.797 **	-1.037 ***
	(0.331)	(0.313)	(0.338)	(0.321)
Currency crisis dummy (3 year lags)	-0.206	-0.343	-0.102	-0.242
	(0.329)	(0.310)	(0.337)	(0.320)
Currency crisis dummy (4 year lags)	-0.277	-0.271	-0.338	-0.316
	(0.321)	(0.302)	(0.329)	(0.312)
Currency crisis dummy (5 year lags)	-0.582 *	-0.497	-0.715 **	-0.605 *
	(0.323)	(0.304)	(0.331)	(0.313)
Banking crisis dummy	-1.031 ***	-0.717 *	-0.873 **	-0.583
	(0.389)	(0.368)	(0.400)	(0.380)
Banking crisis dummy (1 year lag)	-0.572	-0.851 *	-0.647	-0.914 *
	(0.477)	(0.450)	(0.490)	(0.465)
Banking crisis dummy (2 year lags)	0.618	0.399	0.432	0.244
	(0.465)	(0.439)	(0.478)	(0.453)
Banking crisis dummy (3 year lags)	0.160	-0.001	0.074	-0.072
	(0.453)	(0.427)	(0.466)	(0.441)
Banking crisis dummy (4 year lags)	-0.268	-0.050	-0.188	0.016
	(0.451)	(0.426)	(0.464)	(0.440)
Banking crisis dummy (5 year lags)	-0.133	-0.310	-0.384	-0.526
	(0.375)	(0.354)	(0.384)	(0.364)
Number of observations	1547	1547	1568	1568
Number of countries	85	85	85	85

Notes:
1. Numbers in parentheses are standard errors. Significance level are * 10%; ** 5%; *** 1%.
2. All regressions are estimated by G2SLS random-effects IV regression and include the same explanatory variables as those in the regressions in Table 1.

15. **Though the estimated negative impacts are consistent with previous studies, they cannot satisfactorily account for the investment slump after the Asian crisis.** A combined currency and banking crisis is accompanied by a contraction of the investment ratio of about 2 percentage points. While this finding is in line with earlier studies (see Barro and Lee, 2003; Schindler, 2005), it is by far smaller than the 10–20 percentage point investment decline after the Asian crisis. In that respect, the sharp contraction of investment in the Asian-crisis countries was really exceptional.[11]

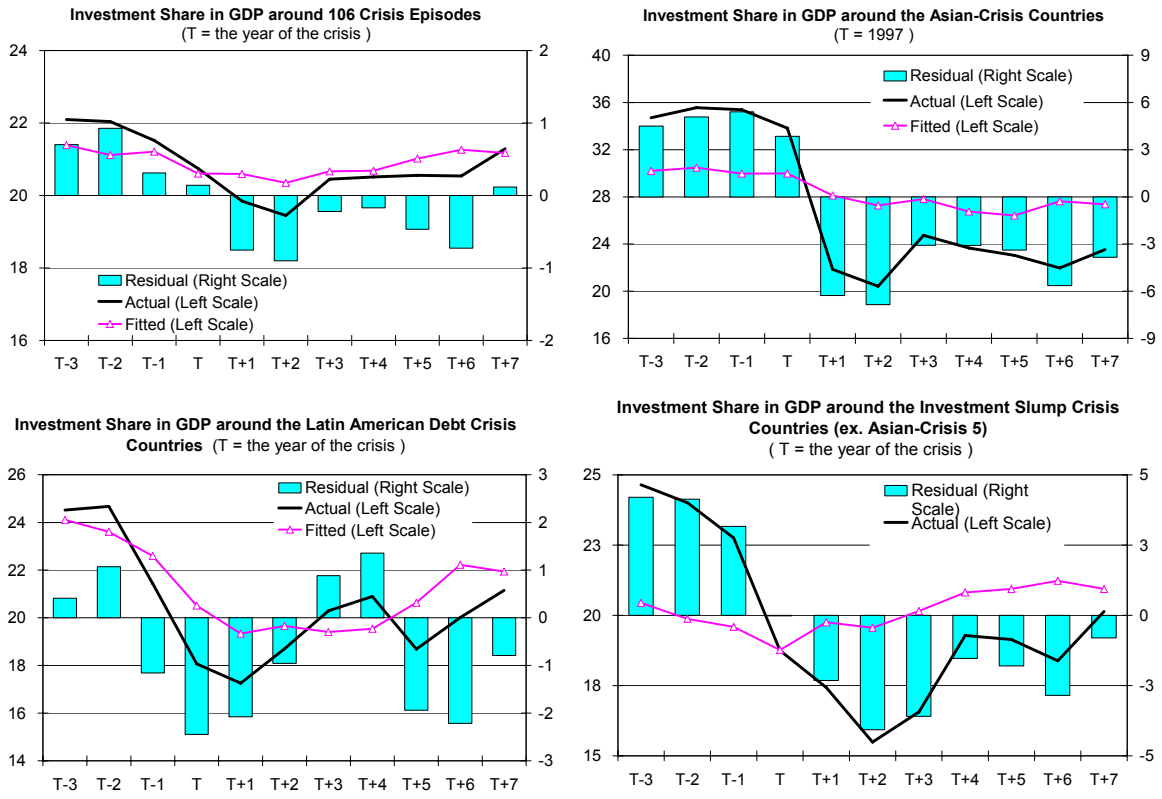
[11] Our interpretation here contrasts with that of Barro and Lee (2003), who argue that the Asian-crisis countries were not exceptional. However, their argument results from their failure to consider the high investment ratio of emerging Asian countries in normal times. If we take that into account, the regression results themselves, that is, column [4] and [5] of Table 1 in the Barro and Lee paper, demonstrate that the drop in investment ratio in the Asian-crisis countries was about 5 percentage points (on a five-year period basis) and thus is exceptionally large.

Deviations from the reference regression

16. **The large difference between the investment collapse after the Asian-crisis and the estimated 2 percent damage from financial crises suggests that the effects of financial crises on investment are highly diverse.** To shed light on the diversity, the sections below focus on crisis events only rather than all observations as was done in the regressions, and they consider in more detail the economic adjustment before and after the crises. To maximize our observations, we focused on currency crises, for which more observations are available; contemporaneous banking crises are examined only as cases of twin crises. After applying a window of three years to isolate independent crises, we identify 106 independent crisis events in 85 countries over the period from 1980–2004.

17. **The changes in investment ratios before and after the crisis events and average deviations from the estimated reference model are reported in Table 3** (see also the figure below.[12] Row (a), which tabulates the average of all 106 events, shows that a currency crisis results in a 1–2 percentage point fall in the investment ratio on average, and roughly

Share of Investment Relative to GDP: Actual vs. Reference Model Prediction



[12] To avoid the specification issue, we here report the average of deviations from regression results in eight forms, that is, four combinations of specification times and two types of estimation (random effect vs. fixed effect).

Table 3. Investment Ratios Before and After Financial Crises and Deviations from the Reference Model

	[1] 1/ 2/ Investment Ratio: before the crisis (Average for period from T-3 to T-1)	[2] 3/ 4/ Change in Investment Ratio: Average Ratio from T to T+1 minus the ratio in column [1]	[3] 3/ 4/ Change in Investment Ratio: Average Ratio from T+2 to T+4 minus the ratio in column [1]	[4] 3/ 4/ Change in Investment Ratio: Average Ratio from T+5 to T+7 minus the ratio in column [1]	[5] 5/ Residual: 3 year Average (from T-3 to T-1)	[6] 5/ Residual: 2 year Average (from T to T+1)	[7] 5/ Residual: 3 year Average (from T+2 to T+4)	[8] 5/ Residual: 3 year Average (from T+5 to T+7)	[9] Average years to reach target bands, i.e., (target level-1, target level+1). 6/ [Ratio of Episodes that recovered] 7/ Model Prediction ±1	[10] Pre-Crisis Level ± 1
(a) Average of all crisis episodes	**21.4 (21.1)**	**-1.6 (-0.8)**	**-2.1 (-0.9)**	**-1.2 (-0.2)**	**0.3**	**-0.5**	**-0.7**	**-0.4**	**2.2 [94/101]**	**2.9 [35/52]**
(b) Asian Crisis in 1997										
(Average of 5 countries)	**35.2 (30.2)**	**-7.4 (-1.2)**	**-12.3 (-2.9)**	**-12.4 (-3.1)**	**5.0**	**-1.2**	**-4.3**	**-4.3**	**3.00 [1/5]**	**not yet**
Thailand T=1997	41.4 (34.1)	-14.3 (-2.6)	-18.9 (-5.8)	-16.1 (-4.1)	7.3	-4.4	-5.9	-4.7	not yet	not yet
Malaysia T=1997	42.1 (32.3)	-7.3 (-0.5)	-17.6 (-2.1)	-20.2 (-3.4)	9.8	3.1	-5.6	-7.0	not yet	not yet
Indonesia T=1997	31.2 (28.1)	-7.0 (-2.0)	-12.9 (-4.1)	-10.8 (-3.5)	3.1	-1.9	-5.7	-4.2	not yet	not yet
Philippine T=1997	23.5 (22.4)	-1.0 (0.7)	-4.0 (0.8)	-6.4 (0.1)	1.1	-0.6	-3.6	-5.5	not yet	not yet
Korea T=1997	37.8 (34.1)	-7.3 (-1.4)	-8.0 (-3.5)	-8.4 (-4.6)	3.7	-2.3	-0.8	-0.1	3	not yet
(c) Latin American Crises in 80s										
(Average of 5 countries)	**23.5 (23.4)**	**-5.9 (-3.5)**	**-5.3 (-4.4)**	**-3.5 (-3.0)**	**0.1**	**-2.3**	**-0.2**	**0.3**	**1.80 [5/5]**	**1.67 [3/3]**
Argentina T=1981	26.3 (23.8)	-4.1 (-4.4)	-6.8 (-5.8)	-7.8 (-5.5)	2.5	2.8	1.5	0.2	0	0
Brazil T=1983	22.5 (22.2)	-6.3 (-3.1)	-2.3 (-1.8)		0.3	-2.9	-0.2		2	2
Chili T=1982	21.6 (21.9)	-11.0 (-3.7)	-5.0 (-4.0)	1.8 (1.9)	-0.3	-7.7	-1.4	-0.5	3	data not available
Mexico T=1982	25.9 (25.6)	-5.2 (-2.3)	-7.0 (-6.0)	-4.5 (-5.5)	0.3	-2.5	-0.6	1.3	3	3
Venezuela T=1984	21.4 (23.7)	-2.8 (-4.0)			-2.2	-1.0			1	data not available
(d) Other Asian countries/economies at the time of the Asian Crisis										
(Average of 6 countries/economies)	**30.8 (29.7)**	**-0.8 (-1.1)**	**-3.3 (-3.1)**	**-5.6 (-4.5)**	**1.1**	**1.4**	**1.0**	**0.0**	**-**	**-**
Hong Kong SAR T=1997	32.8 (27.5)	-1.0 (-1.2)	-6.4 (-2.0)	-10.1 (-3.7)	5.3	5.5	0.9	-1.1	-	-
Singapore T=1997	34.4 (36.8)	1.4 (-0.5)	-3.8 (-5.0)	-15.7 (-8.4)	-2.5	-0.6	-1.3	-9.8	-	-
Taiwan Province of China T=1997	24.5 (23.2)	-0.0 (-1.7)	-2.8 (-3.7)	-5.8 (-6.4)	1.3	3.0	2.2	2.0	-	-
Japan T=1997	28.5 (27.2)	-0.7 (-1.4)	-2.5 (-3.1)	-4.7 (-4.9)	1.3	1.9	1.9	1.5	-	-
China T=1997	40.5 (40.5)	-2.6 (-1.5)	-3.1 (-4.0)	2.6 (-2.5)	0.0	-1.1	0.9	5.2	-	-
India T=1997	23.9 (22.7)	-1.9 (-0.4)	-1.0 (-0.9)	0.2 (-0.9)	1.2	-0.3	1.1	2.3	-	-
(e) Other Episodes of the Investment Slump Crisis 8/										
(Average of 9 episodes)	**23.8 (20.0)**	**-5.7 (-0.7)**	**-6.7 (0.2)**	**-4.6 (1.2)**	**3.8**	**-1.2**	**-3.1**	**-1.9**	**5.71 [7/9]**	**7.33 [3/9]**

Notes:

1. Numbers in column [1] (outside of parentheses) are investment to GDP ratios averaged over 3 years before the crises. Taking an example of the row of Thailand, 41.4 means the averaged ratio for the period from 1994 (=T-3=1997-3) to 1996 (=1997-1) was 41.4 percent.

2. Numbers in column [1] in parentheses are the same period averages of the fitted values (estimated investment ratios) from our reference regressions. Again taking a Thai example, the averaged fitted value for Thailand from 1994 to 1996 is 34.1 percent.

3. Numbers in columns [2]-[4] (outside of parentheses) report changes in the investment to GDP ratio from the pre-crisis average in the column [1]. For example, -14.3 for Thailand and column [2] means the ratio decreased by 14.3 percent to 27.1 percent (1997–98 average) from the pre-crisis 41.4 percent (1994-96 average). Similarly, -18.9 for Thailand and column [3] means the investment ratio decreased by 18.9 percent from 41.4 to 22.5 percent (1999–2001 average).

4. Numbers in columns [2]-[4] (inside of the parentheses) report changes in the estimated investment ratios (averaged fitted values) from their pre-crisis average in the column [1]. For example, (-2.6) for Thailand and column [2] means the estimated ratio decreased by 2.6 percent to 31.5 percent (1997–98 average) from the pre-crisis 34.1percent (1994–96 average). Similarly, (-5.8) for Thailand and column [4] means the averaged fitted value decreased by 4.1 percent from 34.1 to 30 percent (2002–04 average).

5. Numbers in columns [5]-[8] are residuals from the reference regressions averaged over the designated period. For example, -5.9 for Thailand and column [7] means averaged actual investment ratio for 1999 (=T+2=1997+2)-2001(=1997+4) period is higher than the averaged model prediction for the same period by 5.9 percent.

Following relations hold among the columns as long as there is no dropout of samples.

(a) Degree of Pre-Crisis Overinvestment = Figures in column [5] = Outside-Parenthesis figures in column [1] - Inside-Parenthesis figures in column [1]. For example, 7.3 = 41.4 - 34.1.

(b) Degree of Post-Crisis Investment Slump = Figures in columns [6]/[7]/[8] = Outside-Parenthesis figures in columns [2]/[3]/[4] - Inside-Parenthesis figures in columns [2]/[3]/[4] + Degree of Pre-Crisis Overinvestment.
For example, -4.4 = -14.3 - (-2.6) + 7.3.

6. Numbers outside of brackets report (averaged) years to recover the targeted band levels of investment, i.e., reference model predictions ±1 percent point for column [9] and pre-crisis investment ratios ±1 percent point for column [10], respectively. "Not yet" means the investment has not yet reached the targeted level as of 2004. For example, Korea recovered its model prediction level three years after the crisis. None of the Asian-Crisis 5 countries have recovered the pre-crisis levels as of 2004.

7. Fractions in brackets in columns [9] and [10] are ratios of the number of episodes which recovered the targeted band levels to total number of episodes in the groups. For example, [94/101] for row (a) and column [9] means, 94 out of 101 observations examined eventually recovered the model prediction levels of investment in our sample.

8. Nine episodes in (e), i.e., Argentina (1989), Bulgaria (1994), Cameroon (1994), Colombia (1997), Finland (1991), Iran (1993), Russia (1998), Sweden (1992), and South Africa (1984), were selected based on the following four conditions: (i) [2]<0, (ii) [5]>[6], (iii) [7]<-1, and (iv) [8]<0.

half of the fall can be traced by our reference model (without the financial crisis dummies). While the average pre-crisis investment ratio is slightly higher (by 0.3 percentage points) than the model prediction, it falls below the prediction by about 0.5 percentage points to GDP on and after the crisis. However, investment ratios recover the model prediction levels relatively quickly in almost all countries (2.2 years on average).

18. **Investment performance before and after the Asian crisis (row (b) of Table 3) is more extreme than that of the average crisis.** The crisis started from overinvestment of roughly 5 percentage points of GDP, and underwent a nose dive in investment of 12 percentage points on average. Thailand and Malaysia experienced a nearly 20 percent drop. And the post-crisis investment ratio is about 5 percentage points lower than our model predictions, as only one-fourth of the fall can be traced by our model. Four out of five crisis-affected countries (Korea is the exception) have not yet recovered to their model-predicted levels, let alone their pre-crisis levels.

19. **The investment slump after the Asian crisis is remarkable even if compared with the similar investment decline in Latin America during the 1980s debt crisis** (row (c)). While the initial fall in Latin America was comparable to that of the Asian crisis countries, more than half of the decline could be traced by the model, and all Latin American countries recovered to model-predicted investment levels in three years or less. Another distinctive feature that differentiates the Latin American crisis from the Asian crisis is its pre-crisis level of investment. As column [1] or [5] clearly shows, pre-crisis investment before the Latin American crisis was close to the model predicted levels. The investment slump for the Asian-crisis countries also stands out when compared with the other economies in emerging Asia. Although these other economies also faced investment declines in the 2000s (with the exception of China and India), most of the declines can be explained by the model.

20. **Scrutiny of the 106 crisis events reveals the investment slump after the Asian crisis to be exceptional.** In order to find similar examples, we set four criteria to be satisfied by the investment slump crises: (i) the investment rate drops immediately after the crisis (the number in column [2] is negative), (ii) the investment rate relative to its model prediction also drops right after the crisis (the number in column [5] is larger than that in column [6]), (iii) the investment rate two to four years after the crisis is lower than the model prediction by at least 1 percentage point (the number in column [7] is less than -1), and (iv) the investment rate remains below the prediction after five to seven years from the crisis (the number in column [8] is negative). Four of the five Asian-crisis countries satisfy these criteria (Korean investment fails to meet criterion (iii)). Other than the Asian-crisis countries, only 9 out of more than 100 currency crisis episodes could satisfy the criteria.[13] In that sense, the investment decline after the Asian crisis is not just another currency crisis.

[13] See note 8 of Table 3 for the selected crisis episodes.

Characteristics of the investment slump crisis

21. **The investment slump crisis was preceded by a period of overinvestment.** The nine episodes selected were characterized by a sizable and prolonged investment slump as previously defined (see row (e) of Table 3), though the severity of the slump was not as great as in the Asian crisis. Another point that should be noted is the evidence of pre-crisis overinvestment (see column [5] of row (e)). This evidence, which appeared independently of our criteria, supports the conventional belief that a high run-up before the crisis leads to a harder crash.

22. **The investment slump crisis hit seemingly well-performing economies** (see Table 4). Pre-crisis investment rates are generally higher in the investment slump crises, and moreover, there appears to be a run-up phase just before the investment crash (column [1]). Columns [2] to [5] report the differences in four fundamental variables that are often considered to be grounds for financial crisis. Perhaps surprisingly, the saving rate is higher and the fiscal condition appears healthier in the investment slump crises. On the other hand, there appears to be a pre-crisis escalation of the current account deficit before the investment slump, probably due to an exuberant private sector, followed by a strong reaction after the crisis. We could not detect systematic differences regarding inflation.

23. **The pre-crisis overinvestment appears to be fueled by an overly optimistic public mood and lax financing.** Shares of short-term debt to total external debt are higher for the investment slump crises, though the difference is not statistically significant. Then again, we notice pre-crisis inflows of short-term capital in the slump episodes. The domestic credit to GDP ratio is also higher, and we can observe rapid pre-crisis expansion of credit in the investment slump countries. That is to say, there seem to be fast growing credit markets during the period leading up to the investment slump crises, allowing economies to expand far beyond market fundamentals. Optimistic pre-crisis evaluations by country risk rating institutions[14] corroborate the overly optimistic mood before the investment slump crises. The degree of currency devaluation after the crises is not very different between the two groups, despite the clear difference observed in their current account outcomes. The ratio of twin crises, or contemporaneous currency and banking crises, is significantly higher for the investment slump crises, suggesting that the banking sector had a role in the investment slump.

[14] Columns [8] and [9] of Table 5, respectively, report the financial risk index and the political risk index from the Poverty Reduction Strategy (PRS) group. The financial risk index ranges from a high of 50 (least risk) to a low of 0 (highest risk), while the political risk index ranges from 100 (least risk) to 0 (highest risk).

Table 4. Comparison Between Investment Slump Crises vs. Non-Investment Slump Crises

		[1] Investment Ratio	[2] Saving Ratio	[3] General Government Balance (Ratio to Nom. GDP)	[4] Current Account Balance (Ratio to Nom. GDP)	[5] Inflation Rate	[6] Share of Short-term Debt to Total External Debt	[7] Domestic Credit to Nom. GDP	[8] Financial Risk Index	[9] Political Risk Index	[10] Real Effective Exchange Rate [T-3,T-1]=1.0	[11] Twin Crisis Ratio
(a) **All Sample (106 Episodes)**	Level [T-3,T-1] 2/	21.4 [21.5]	17.4 [18.7]	-4.5 [-4.3]	-3.1 [-3.1]	33.2 [11.9]	16.7 [14.0]	35.2 [26.9]	30.4 [28.9]	59.7 [61.3]	1.0	0.36
	Change from [T-6,T-4] to [T-3,T-1]	-0.3	0.1	-0.2	0.3	-111.8	-0.3	3.1	1.6	1.9	-0.7	
	Change from [T-3,T-1] to [T,T+1]	-1.6	-0.4	-0.3	0.6	37.7	-2.8	0.4	-0.6	-0.2	-11.2	
	Change from [T-3,T-1] to [T+2,T+4]	-2.2	-0.1	0.6	1.9	78.4	-4.5	-2.3	2.5	3.1	-12.0	
(b) **Investment Slump Sample (14 Episodes)**	Level [T-3,T-1] 2/	27.5 [24.5]	25.5 [27.0]	-1.6 [-1.4]	-4.5 [-3.9]	37.9 [8.8]	24.5 [19.2]	61.5 [53.6]	36.4 [38.3]	66.7 [64.5]	1.0	0.80
	Change from [T-6,T-4] to [T-3,T-1]	0.9	-2.0	0.6	-1.1	-73.8	2.6	11.1	2.0	4.4	-1.2	
	Change from [T-3,T-1] to [T,T+1]	-6.6	-1.6	-2.6	4.7	161.8	-4.6	7.5	-4.3	-2.4	-14.9	
	Change from [T-3,T-1] to [T+2,T+4]	-8.4	-0.8	-1.6	7.5	2.0	-9.5	-5.0	-0.2	-0.8	-16.8	
(c) **Asian Crisis (5 Countries)**	Level [T-3,T-1] 2/	35.2 [37.8]	31.7 [35.4]	1.1 [1.4]	-4.6 [-3.9]	6.1 [5.6]	25.8 [22.2]	85.0 [62.8]	41.9 [43.0]	70.4 [69.3]	1.0	1.00
	Change from [T-6,T-4] to [T-3,T-1]	1.5	0.3	0.8	-0.9	-1.0	3.6	18.9	0.4	6.4	3.1	
	Change from [T-3,T-1] to [T,T+1]	-7.4	0.7	-2.0	7.3	5.2	-2.6	17.1	-11.4	-3.6	-14.4	
	Change from [T-3,T-1] to [T+2,T+4]	-12.3	-0.8	-4.4	11.2	-1.5	-11.2	-2.6	-4.2	-5.0	-21.1	
(d) **Other Slump Crises (9 Episodes)**	Level [T-3,T-1] 2/	23.6 [23.1]	22.4 [22.0]	-2.6 [-3.1]	-4.5 [-4.0]	53.8 [19.3]	23.7 [14.0]	49.7 [39.8]	33.3 [32.7]	64.7 [61.7]	1.0	0.70
	Change from [T-6,T-4] to [T-3,T-1]	0.5	-3.1	0.5	-1.2	-110.1	2.3	6.8	3.0	3.1	-4.2	
	Change from [T-3,T-1] to [T,T+1]	-6.2	-2.7	-2.8	3.3	240.1	-5.8	2.7	-0.4	-1.7	-15.1	
	Change from [T-3,T-1] to [T+2,T+4]	-6.5	-0.8	-0.5	5.7	3.8	-8.6	-6.2	2.1	1.6	-14.4	
(e) **Non-Investment Slump Sample (92 Episodes)**	Level [T-3,T-1] 2/	20.4 [20.8]	16.0 [18.0]	-5.0 [-4.4]	-2.9 [-3.0]	32.4 [12.0]	15.7 [13.7]	30.8 [23.3]	29.1 [27.9]	58.2 [60.1]	1.0	0.29
	Change from [T-6,T-4] to [T-3,T-1]	-0.51	0.4	-0.3	0.5	-118.0	-0.7	1.8	1.5	1.3	-0.7	
	Change from [T-3,T-1] to [T,T+1]	-0.76	-0.3	0.1	0.0	17.2	-2.6	-0.8	0.2	0.3	-10.5	
	Change from [T-3,T-1] to [T+2,T+4]	-0.79	0.0	1.2	0.7	95.0	-3.6	-1.7	3.4	4.3	-11.1	
(f) **H0: (b)=(e) 3/ (Welch's Test)**	Level [T-3,T-1]	3.2 ***	4.1 ***	2.6 **	-1.8 *	0.3	1.3	2.9 ***	2.8 **	2.5 **	-	3.8 ***
	Change from [T-6,T-4] to [T-3,T-1]	1.0	-1.6	1.2	-1.1	0.4	1.3	2.4 **	0.3	1.3	-0.1	
	Change from [T-3,T-1] to [T,T+1]	-6.0 ***	-1.4	-2.2 **	3.9 ***	0.9	-0.6	2.0 *	-2.3 **	-1.2	-0.8	
	Change from [T-3,T-1] to [T+2,T+4]	-5.0 ***	-0.6	-1.6	4.4 ***	-1.4	-1.1	-0.6	-1.6	-1.9 *	-0.6	

Notes:

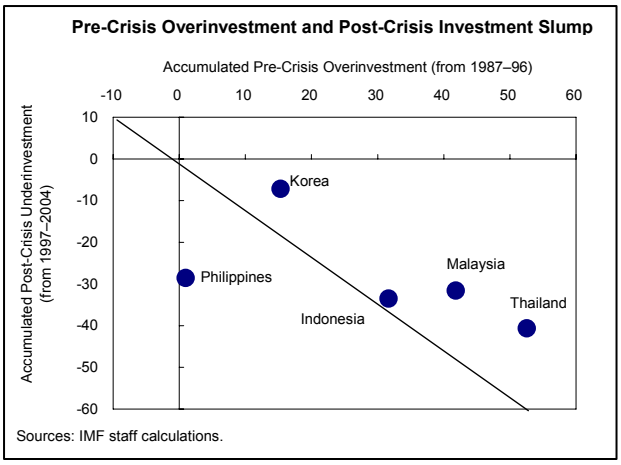
1. Reported figures in columns (a)-(e) are the averages of crisis episodes included in each categories. Since some data are not always available for all episodes, number of observations in each calculation does not necessarily equal to the reported total observations.

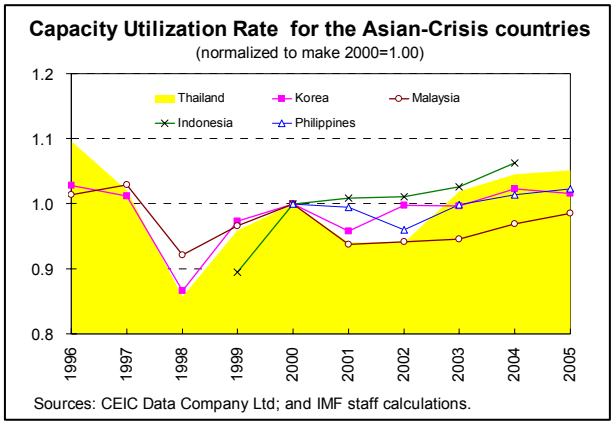
2. Figures in the brackets in the rows of "Level" are medians to see the effects of abnormal observations.

3. Row (f) reports the result of hypothesis testing to see whether the averages of selected categories are significantly different. Figures in column [1]-[10] are T-statistics for Welch's Test, and figures in column [11] are normal st ***, **, and * in row (f) indicate statistical significance at 1, 5, and 10%, respectively.

D. What Might Explain the Deviation?

24. **Several factors, certainly more than those examined in our regressions, contributed to the investment slump after the Asian crisis.** A buildup of excess capacity in the run-up to the crisis and corporate overleveraging, which resulted partly from excess reliance on foreign currency loans, look consistent with our findings (except for the Philippines). However, nearly a decade has passed since the crisis, and capacity utilization has generally returned to its pre-crisis level, so overinvestment cannot be a full explanation of the still low investment. Although lack of comprehensive cross-country data keeps us from further formal testing, this section examines possible reasons for lower Asian investment than expected, by focusing only on the Asian-crisis countries. In particular, it considers three possible explanations: (i) a riskier investment environment, (ii) weakness in the financial and corporate sectors, and (iii) sluggish nontradable sectors.[15]

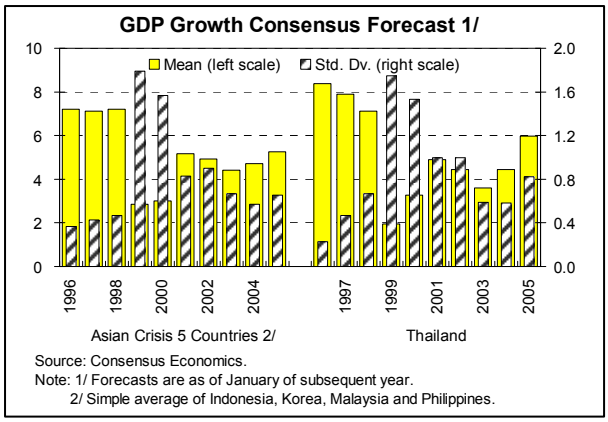


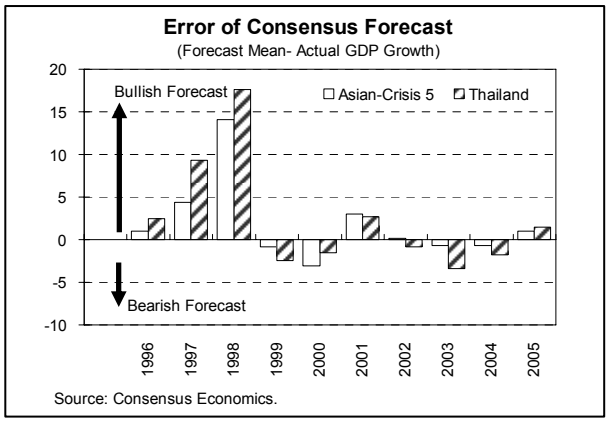


Riskier investment environment

25. **Heightened risk of investment after the crisis could have depressed investment.** Modern investment theories predict that greater uncertainty will lead agents to put off investment (Dixit and Pindyck, 1994). Evidence for higher risk is the standard deviation in the consensus forecast of GDP growth for the Asian countries, which increased sharply after the crisis. Both the higher investment risk and the pessimistic growth expectation, which has been more depressed than actual growth, could have pushed down post-crisis Asian investment, as is argued in REO (May 2006).

[15] These three are all raised by recent issues of Asia and Pacific Regional Economic Outlook (REO). REO (May 2006) also examines foreign direct investment (FDI) diversion to China. However, we neglect this explanation here, since FDI is a relatively small part of total investment, and FDI into Thailand increased right after the crisis. Moreover, recent studies (Eichengreen and Tong, 2005, and Mercereau, 2005) failed to find formal evidence of FDI diversion.





26. **However, measures of macroeconomic volatility have lately returned to their pre-crisis level**.[16] The standard deviations of macroeconomic variables, that is, industrial production, wholesale/producer price, and stock price, have generally returned to their pre-crisis levels in the Asian-crisis countries. Therefore, this casts doubt on explanations that rely on actual volatility as an indication of increased risk.

Fluctuations of Macro Indicators Before and After the Crisis

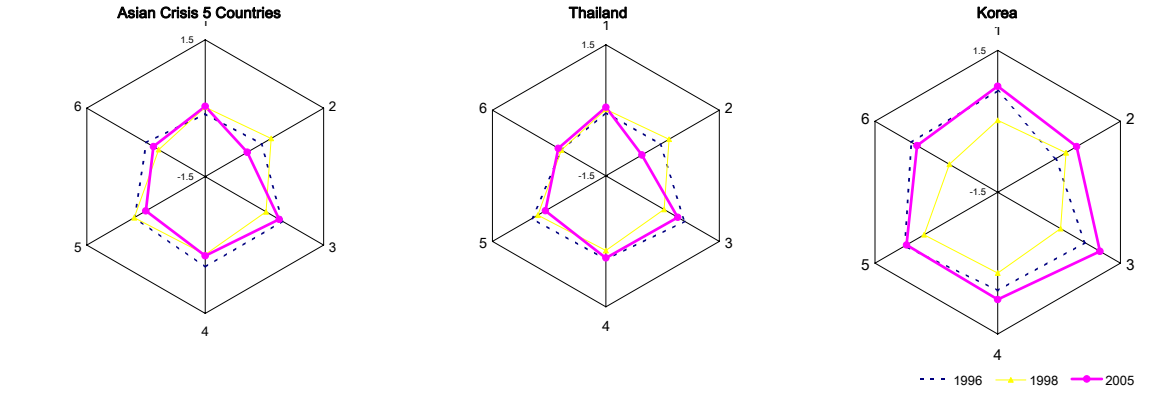
	S.D. of Annualized Quarterly Growth Rate				
	Thailand	Indonesia	Korea	Malaysia	Philippines
Industrial Production					
1992.1q–1997.2q	8.9	16.5	9.9	6.6	15.0
1997.3q–2002.4q	12.2	23.2	16.3	18.6	16.8
2003.1q–2006.1q	8.1	13.3	6.8	8.0	21.2
Wholesale Price Index					
1992.1q–1997.2q	4.6	5.3	2.7	5.6	8.5
1997.3q–2002.4q	9.7	47.9	11.1	11.3	4.9
2003.1q–2006.1q	5.3	10.4	4.8	8.5	4.0
Stock Price Index					
1992.1q–1997.2q	61.8	42.5	39.1	39.2	51.5
1997.3q–2002.4q	78.1	63.2	90.6	76.0	68.9
2003.1q–2006.1q	45.8	34.8	38.2	19.4	19.6

Sources: CEIC Data Company, Ltd.; and IMF staff calculations.

27. **Nonetheless, despite the waning actual volatility, the perceived investment environment continues to be weak compared with the pre-crisis period.** Worldwide Governance Indicators by the World Bank Institute evaluate the governance environment of countries along six dimensions—voice and accountability, political stability, government effectiveness, regulatory quality, the rule of law, and control of corruption. The indicators for the Asian-crisis countries generally deteriorated after the crisis, and have not yet recovered, except those for Korea. Relatively sound investment in Korea (see the residuals in the column [8] of Table 3) may indicate the importance of these perceptions on investment.

[16] As another piece of evidence of the waning risk, sovereign spreads for Thailand and Malaysia are consistently shrinking after their post-crisis jump.

Worldwide Governance Indicators for the Asian Crisis Countries

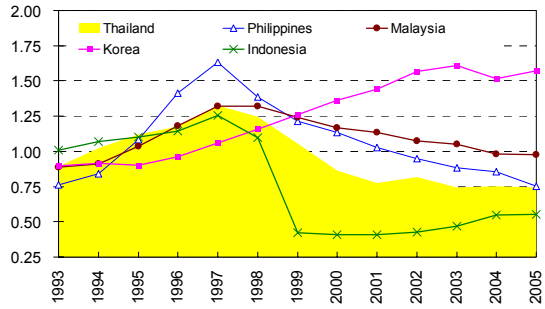


Sources: World Bank, Worldwid Governance Indicators; and the Fund staff calculations.
1. Voice and Accountability, 2. Political Stability/No Violence, 3. Government Effectiveness, 4. Regulatory Quality, 5. Rule of Law, and 6. Control of Corruption.
Index lies in the range between minus 2.5 and plus 2.5, with higher values denoting better governance environments.

Weakness in financial and corporate sectors

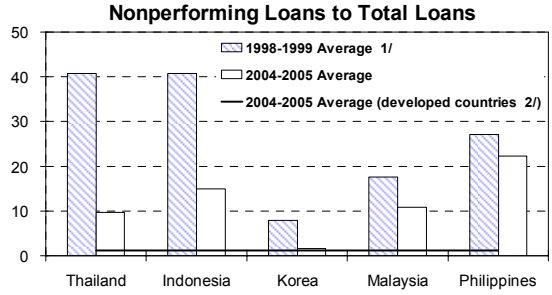
28. **While financial and corporate sector restructuring has progressed, financing may be a constraint on investment.** In the aftermath of the Asian crisis, the sharp deterioration in banking-system solvency and liquidity caused banks to rein in credit, with a sizable impact on investment. This was exacerbated by bank-dominated financial systems. Credit to the private sector as a share of GDP fell drastically and has not yet recovered. While significant progress in restructuring has mitigated the impact of the financial crises,[17] still

Credit to Private Sector Relative to GDP
(1990–97 average=1.0)



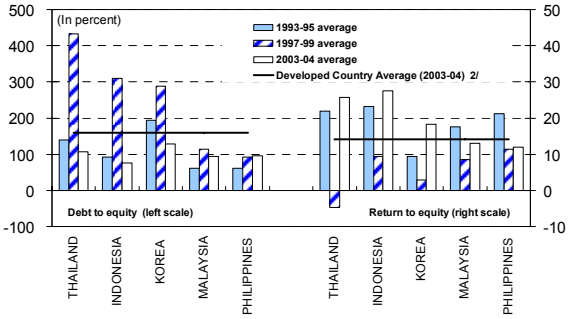
Sources: IMF, International Financial Statistics; and IMF staff calculations.

Banking Sector Bank Restructuring: Nonperforming Loans to Total Loans



Sources: Bank of Thailand; and Global Financial Stability Report.
1/ Figure for Philippines is 2001-2002 average.
2/ Simple average of Australia, Japan and the U.S.A.

Progress in Corporate Sector Restructuring



Sources: Corporate Vulnerability Utility; and IMF staff calculations.
1/ Capital weighted mean.
2/ Simple average of Australia, Japan, and the U.S.

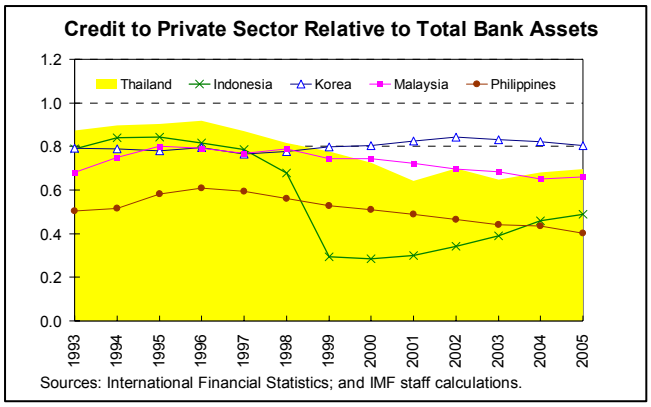
[17] REO (May 2006) argues that corporate and financial sector restructuring, which once acted as a constraint on investment, no longer seem to be an important factor at a regional level. Indeed, corporate restructuring in the region seems to have been largely completed at least for listed firms.

high nonperforming loan (NPL) ratios for four out of five crisis countries[18] remains an issue. This may be particularly true for small and medium enterprises (SMEs) that do not have access to capital markets (see table below). As a sign of the severe lending climate, the share of claims on the private sector in total bank assets continued to fall until 2005 in three crisis countries including Thailand (see figure below). The relatively better performance of Korea in this regard again seems to suggest some role of financial factors in the lingering investment slump.

Share of Firms that Regard Financing as an Obstacle

	Large Firms		Small and Medium Firms	
	Moderate	Major Obstacle	Moderate	Major Obstacle
Thailand	39%	11%	34%	44%
Indonesia	23%	39%	18%	41%
Malaysia	18%	6%	19%	26%
Philippines	20%	42%	29%	38%

Source: World Bank, World Business Environment Survey, 2000.



Sluggish nontradable sector

29. **The difference in performance between tradable (T) and nontradable (N) sectors may also explain the low investment in the Asian-crisis countries.** REO (September 2006) argues that a source of the post-crisis investment decline is financially starved N sector producers.[19] Firms in the T sector, typically large and able to pledge export receivables as collateral, have better access to international capital markets. Firms in the N sector, which are generally smaller, rely predominantly on domestic bank credit. In the face of cautious banks after the crisis, the smaller N firms were hit especially hard and benefited little from subsequent exchange rate depreciation due to their domestic nature. As the capacity utilization only covers mining and manufacturing industries, which largely overlap with the T sector, the sluggish N sector may fill the gap between the capacity utilization recovery and the investment slump.

30. **While corroboration is needed, casual observation from the *World Business Environment Survey* is loosely consistent with the premise of the sluggish N sector hypothesis.** First, firms in the T sector tend to be larger than those in the N sector, if we identify exporters with T sector firms and nonexporters with N sector firms. Second, the share of firms that regard financing as a major obstacle to their business is generally higher for the N sector firms. These findings agree well with our inference of a credit-constrained

[18] Thailand's NPLs have declined to 8.2 percent of total loans as of Q3, 2006.

[19] See Box 5.1 in the Asia and Pacific REO (September 2006) by Yong Sarah Zhou. Also see Tornell and Westermann (2003) for detailed discussion.

N sector, though the observed differences between the two sectors are very slight, and the number of observations for individual countries is not sufficient to be conclusive.[20]

Size and Sectoral Distribution

	Small Firms		Large Firms	
	N Sector	T Sector	N Sector	T Sector
Thailand	61%	39%	24%	76%
Indonesia	82%	18%	54%	46%
Malaysia	65%	35%	40%	60%
Philippines	73%	27%	48%	52%

Sources: Tornell and Westermann (2003) that bases on World Business Environment Survey (WEBS, 2000).

Notes:

1. Small denotes small and medium firms up to 200 employees.
2. Large firms have more than 200.

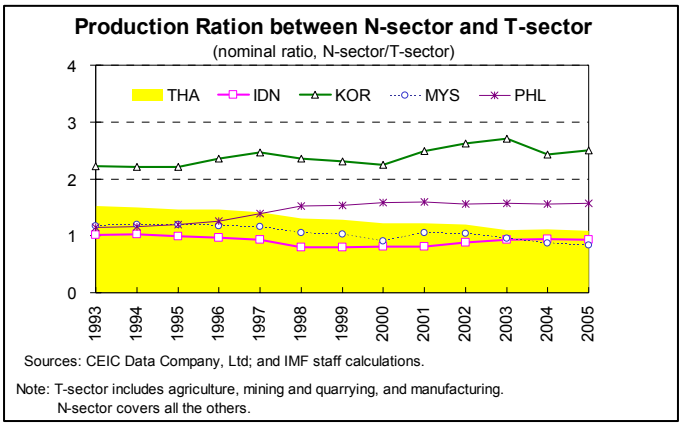
Share of Firms that Regard Financing as a Major Obstacle in Their Business Environment

	Sector		Export	
	T Sector: Agriculture and Manufacturing	N Sector: Others 1/	T Sector: Yes	N Sector: No
Thailand	36%	46%	39%	43%
Indonesia	33%	43%	36%	43%
Malaysia	20%	24%	13%	29%
Philippines	41%	35%	45%	37%

Sources: World Bank, World Business Environment Survey (WBES, 2000) Interactive Dataset.

1/ Others include construction, service, and other.

31. **The sluggish N sector may partially explain the investment slump for a few countries including Thailand.** In the aftermath of the crisis, N sector output dropped relative to that of the T sector in three emerging-Asian countries, that is, Indonesia, Malaysia, and Thailand. Unfortunately, the lack of data on sectoral investment prevents us from region-wide examination; however, the progress of the capital-output ratio by sector in Thailand, that is, still high N sector capital-output ratio, seems to

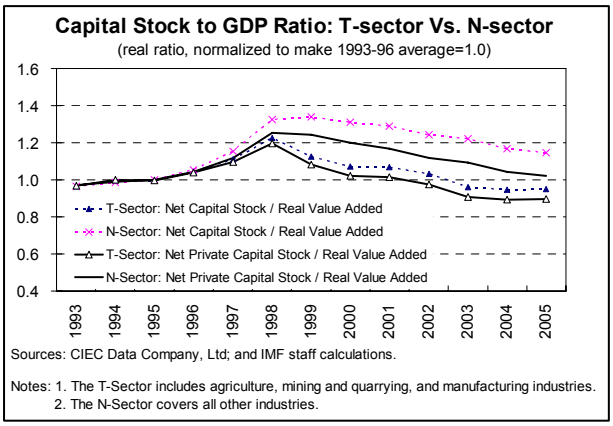


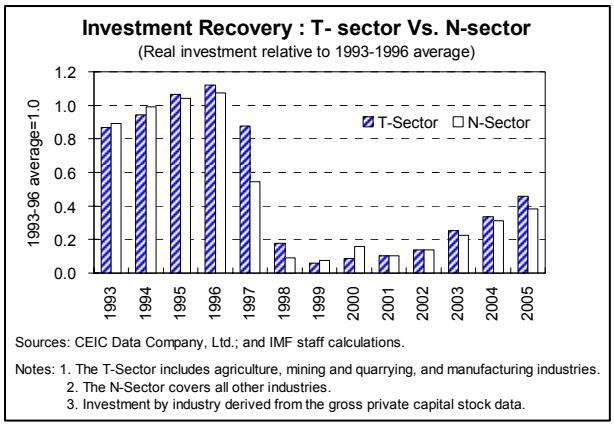
Sources: CEIC Data Company, Ltd; and IMF staff calculations.

Note: T-sector includes agriculture, mining and quarrying, and manufacturing. N-sector covers all the others.

[20] While the WBES is a survey of over 10,000 firms in 80 countries, the number of observations for individual countries is of the order of 100-200.

indicate N sector problems in the country. Our tentative estimates of Thai sectoral investment[21] reveal that the recent pace of investment recovery in the N sector is slightly slower than that in the T sector. As the N sector investment represents roughly seventy percent of total private investment, even the slight difference may be one of the contributing factors to the prolonged investment slump.





E. Summary and Policy Implications

32. **This paper first argued the Asian investment slump is related to pre-crisis overinvestment.** Since the overinvestment leading to the Asian crisis was exceptionally high, it is natural to see a sizable and prolonged investment slump in the crisis-hit countries. As overinvestment took place largely due to optimistic market expectations, we cannot expect investment in emerging Asia to recover its pre-crisis level. On the other hand, we might well expect investment to be an important contributor to output growth, as long as the factors hindering investment fade away over time.

33. **Three factors (other than overinvestment) were examined that may explain the slow investment recovery from the Asian crisis.** These are (i) a riskier investment environment, (ii) weakness of the financial and corporate sectors, and (iii) a sluggish nontradable sector. Perceived investment risks continued to be high compared with the pre-crisis period, while actual macroeconomic volatility has lately returned to its pre-crisis levels. Financing still seems to restrain investment, though significant progress in restructuring has certainly mitigated this factor. The sluggish N sector is a constituent of the investment slump at least for a few countries including Thailand.

34. **However, none of the factors above can by themselves explain the investment slump in the Asian-crisis countries.** Indeed, the sluggish N sector holds true only for a few

[21] Here we estimated the investment by sector as an increment of sectoral gross capital stocks.

selected countries. The uncertainty and restructuring are convincing as an explanation of regional development as a whole; however, they may not be as useful in explaining cross-sectional diversity among countries in the region (except in the case of Korea's relatively better performance). Even overinvestment, the core account of this paper, does not apply to the Philippines episode. Various combinations of factors rather than one single factor, therefore, seem to account for emerging Asia's investment slumps.

35. **These findings suggest several policy implications:**

- In view of the cost of overinvestment, it is crucial that policies help foster balanced growth in investment. What is needed is private investment that is justified by economic fundamentals, as investment growth that is too high can jeopardize economic stability.

- Prudent macroeconomic policies, along with clear communication about the policy framework, will help to contain any increase in perceived macroeconomic risks. From this standpoint, the recent monetary policy stance of inflation targeting with a flexible exchange rate seems to be serving Thailand well.

- Efforts to remove obstacles to private investment, such as reducing red tape, improving governance, and establishing political stability, also would be helpful to deal with uncertainty and the investment climate.

- Addressing the legacies of the Asian crisis in financial and corporate sectors could help to stimulate investment. For example, the ratio of NPLs to total loans and the level of distressed assets while declining are still high. Further progress on this front remains a priority.

- Taking steps to expand the potential sources of financing, especially by encouraging the development of bond markets, would improve the efficiency of financial intermediation and provide backstops for banking systems in the crisis. Policies to reduce small firms' excessive reliance on bank credit and/or those to encourage bank lending to small firms might be a key to ameliorate the present situation.

36. **Given the complicated roots of the post-crisis investment slump in emerging Asia, a policy package that takes into account all of the necessary measures above is needed.** Going forward, productivity should be raised over the long run to further boost returns on investment, since that is the only way to maintain steady investment given an increasingly competitive international business environment.

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III. Public Investment in Thailand: Macroeconomic Effects and Implementation[22]

A. Background

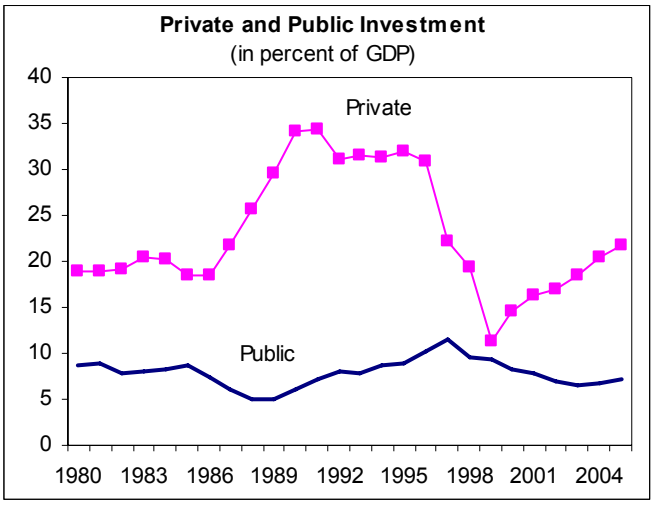
37. **In the aftermath of the Asian crisis, investment in Thailand collapsed.** Gross fixed investment dropped from over 40 percent of GDP during 1990–96 to about 20 percent of GDP in 1999. To some extent, this sharp decline reflected the extremely high investment rates in the decade running up to the crisis. However, investment in the aftermath of the crisis was low even relative to its pre-1990 average of about 29 percent of GDP.

Investment in Thailand
(in percent of GDP)

	Pre-1990	1990–96	Post-1997
Total	28.6	40.5	23
Private	21.2	32.3	15.1
Public	7.4	8.2	7.9

Source: Bank of Thailand

38. **While the sharp fall in private investment was the main driver of the decline in overall investment, public investment also contributed to the slowness of the post-crisis investment recovery.** At the onset of the crisis, the drop in investment was largely due to lower private investment, with public investment remaining broadly stable as a share of GDP. In the following years, however, public investment continued to contract in nominal terms and started to recover only in 2004, resulting in an average nominal growth rate of only 0.4 percent over the 2000–04 periods. This largely reflected the post-crisis fiscal consolidation and the marked increase in public debt associated with the financial sector bailout. In addition, the share of public investment in GDP almost halved from 12 percent in 1997 to around 6 percent in 2004.



39. **Against this background, in November 2005 Thailand's authorities announced plans for B 1.8 trillion in new infrastructure spending over 2006–09, which was revised down to B 1.3 trillion in June 2006.** The megaprojects will be concentrated mostly in transportation, including mass transit, and water irrigation projects. These sectors comprise about 48 percent of overall spending. Real estate investment—mainly the completion of

[22] Prepared by Ivan Tchakarov.

low-cost housing projects and government building—accounts for 18 percent, and the expansion of education and public health services for the remainder. The plan has not been officially announced due to the political change in September 2006, and the envisioned expenditure may be further revised by the new authorities in line with their own priorities. Nevertheless, the need for the infrastructure investments remains, and the government has already proposed investment in three infrastructure projects: logistics, mass transit, and water management. The cabinet agreed in November 2006 to carry out five lines of mass transit projects that cost B 165 billion.

Megaproject Spending
(in billions of baht)

	2006	2007	2008	2009	2006–09
Mass transit	0.3	28	76	46	150
Housing	29	44	116	55	244
Transporation	35	91	72	81	279
Water resources	70	60	42	32	204
Education	4	15	28	33	80
Public health	0.3	13	31	30	74
Other	28	71	99	100	298
Total	**167**	**322**	**464**	**377**	**1330**

Source: Public Debt Management Office, Ministry of Finance.

40. **The purpose of this chapter is to assess the need for, and the effects of, the megaproject initiative, and to describe best international practices in implementing large public spending programs.** The chapter shows that infrastructure development in Thailand still lags behind more advanced regional competitors, which could prove to be a drag on competitiveness and growth prospects. In Thailand the megaprojects fit within the authorities' medium-term fiscal framework without hindering debt sustainability. Regarding financing, in the face of budget constraints in most developing countries, private sector participation in the provision of infrastructure services via the channel of public-private partnerships (PPPs) has become more prominent. The paper also finds that while PPPs offer an increasingly popular vehicle for providing infrastructure, the results that they have produced around the world are mixed. In particular, in order to ensure positive results, it is imperative that the PPPs are carried out to increase efficiency rather than to move expenditure off the budget. In addition, governments have often granted generous minimum income guarantees to contract winners with potentially undesirable budgetary consequences. In that respect, the paper also considers some alternative approaches to implementing PPPs that may eliminate the incentives for renegotiating contracts and for providing generous minimum income guarantees.

41. **The paper is organized as follows.** Section B displays a battery of infrastructure rankings for a number of Asia Pacific countries. Section C discusses the link between public investment and growth. Section D assesses the sustainability of the public investment plans. Section E analyzes different financing options. Section F looks at international experience with PPPs, and Section G draws conclusions and offers some policy advice.

B. Does Thailand Need More Infrastructures?

42. **Various indicators suggest that there is a need for improving infrastructure in Thailand.** Figure 1 provides a comparison of various infrastructure indicators among selected Asia Pacific countries along a number of dimensions. Clearly ASEAN-4 and low-income countries in the region lag behind the newly-industrialized and industrial economies in Asia in terms of the provision and overall quality of infrastructure services. Thailand is no exception in this regard although in general it compares favorably to other ASEAN-4 countries and, in particular, to the low-income countries in the region.

43. **Deficiencies in transportation figure prominently in the infrastructure ranking.** The need for upgrading infrastructure seems particularly acute in the area of transportation where Thailand lags appreciably behind the newly-industrialized countries in Asia. Relieving transpiration bottlenecks would therefore be an important step in any public investment program and the megaprojects envisage that about 40 percent of all planned spending be directed to mass transit projects and other transportation-related initiatives.

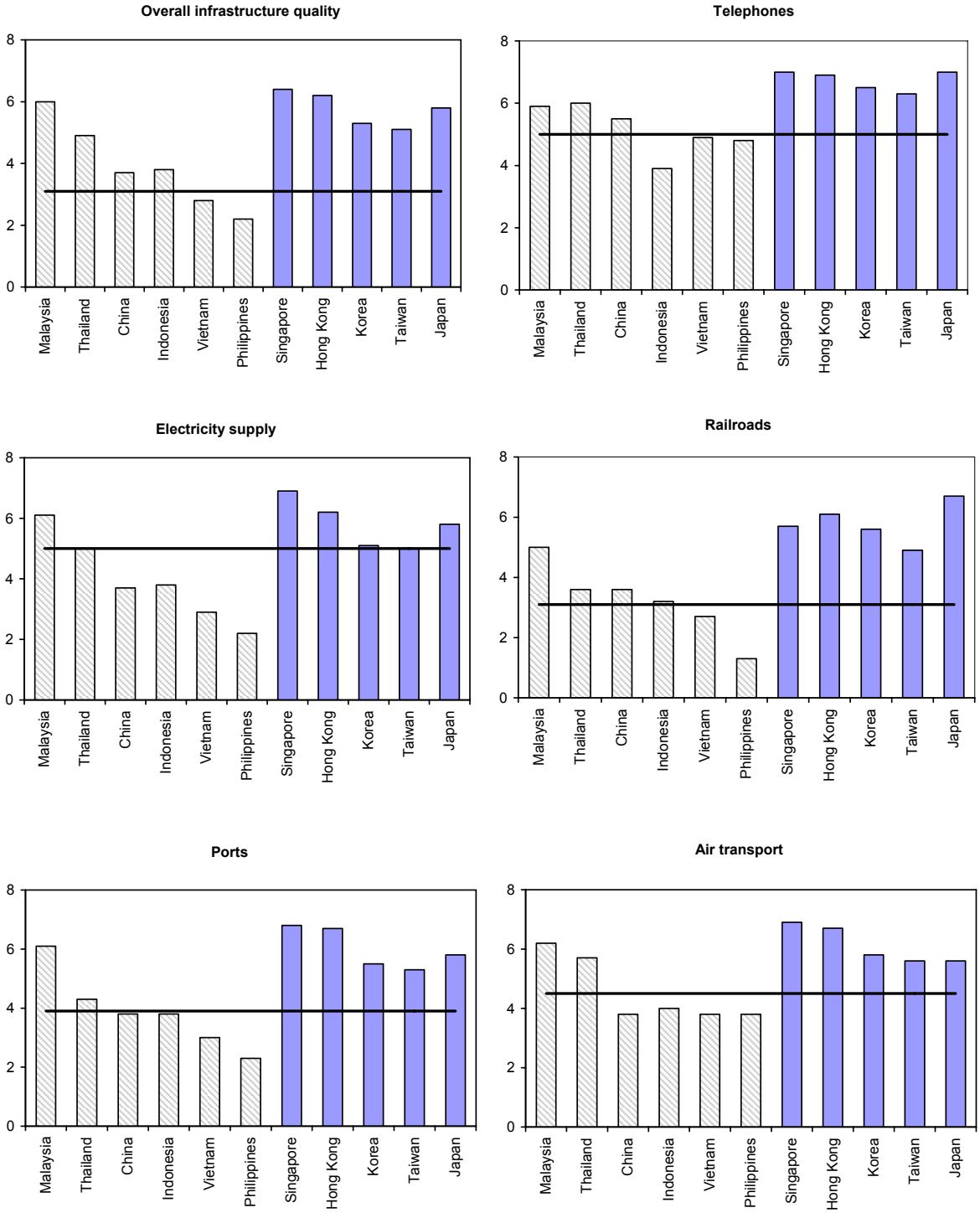
C. Public Investment and Growth in an International Perspective

44. **Over the last three decades, the share of public investment in GDP has declined on average in advanced OECD countries, and more significantly so in Latin America, where it has also displayed substantial volatility.** This decline has been wholly or partly offset in these regions by a rising share of private investment in GDP. The share of total investment in GDP has fallen in OECD countries, while it has fluctuated around a broadly flat trend in Latin American countries. In contrast, the share of public investment in GDP has shown on average no clear upward or downward trend in Asian and African countries, albeit with significant volatility in some countries. The same is true for the shares of private and total investment in GDP in African countries. In Asian countries, these shares showed a rising trend through the mid-1990s, but fell sharply in the aftermath of the crisis that hit Southeast Asia in 1997.

45. **While a declining share of public investment in GDP may in theory adversely affect economic growth, the empirical evidence in this area remains mixed.** While individual infrastructure projects may often generate fairly high returns on investment, their impact on GDP growth is more uncertain.[23] Empirical studies that have tried to estimate such impact have yielded a wide range of results, although evidence of a positive impact appears to be more robust for developing countries. Briceno-Garmendia and others (2004) suggest that of 102 studies that have estimated the impact of infrastructure investment on productivity or

[23] For example, World Bank-financed infrastructure projects that had at least 95 percent of loan commitments disbursed between 1999 and 2003, had an average economic return of 35 percent, with a spread ranging from 19 percent for water and sanitation projects to 43 percent for transportation projects.

Figure 1. Infrastructure Rankings



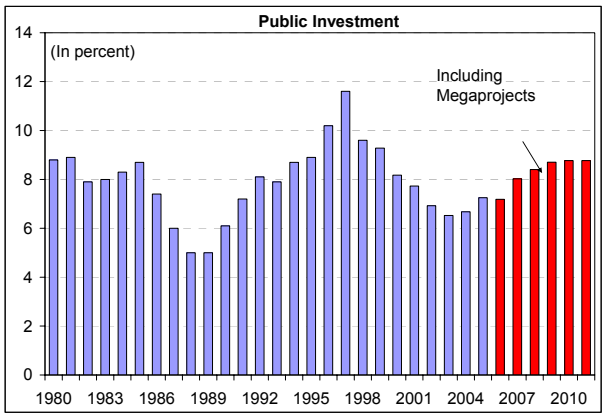
Source: World Economic Forum (2005).
1/ The horizontal line is the average for all surveyed countries.

growth, 53 percent showed a positive effect, 42 percent showed no significant effect, and 5 percent showed a negative effect. In multiple country studies, 40 percent showed a positive effect, 50 percent showed no significant effect, and 10 percent showed a negative effect. In contrast, all 12-single-country developing country studies showed a positive effect.

46. **The difficulty in uncovering a conclusive positive impact of public investment on growth may be due to a number of factors.** These include: (i) the difficulty in controlling for all the factors, in addition to public investment, that affect growth over the long term; (ii) the fact that a sizable portion of public investment is directed to supporting broad functions of government, including redistribution and the provision of public services, maintaining law and order, and administration, which do not directly boost productive potential; (iii) the lumpy nature of infrastructure investment, which implies that the full impact of investment in roads, telecommunications, and other infrastructure on growth can only be realized with considerable lags, once effective networks have been established.

D. Sustainability of Public Investment Plans

47. **The megaprojects will bring public investment closer to its historical levels.** The share of public investment in GDP has hovered around 8 percent in the pre-crises period, before shooting up to 12 percent in the immediate run-up to the crisis. Staff estimates that the megaproject initiative will raise the share of public investment in GDP to about 9 percent in the medium term—closer to historical averages, but below its pre-crisis peak.



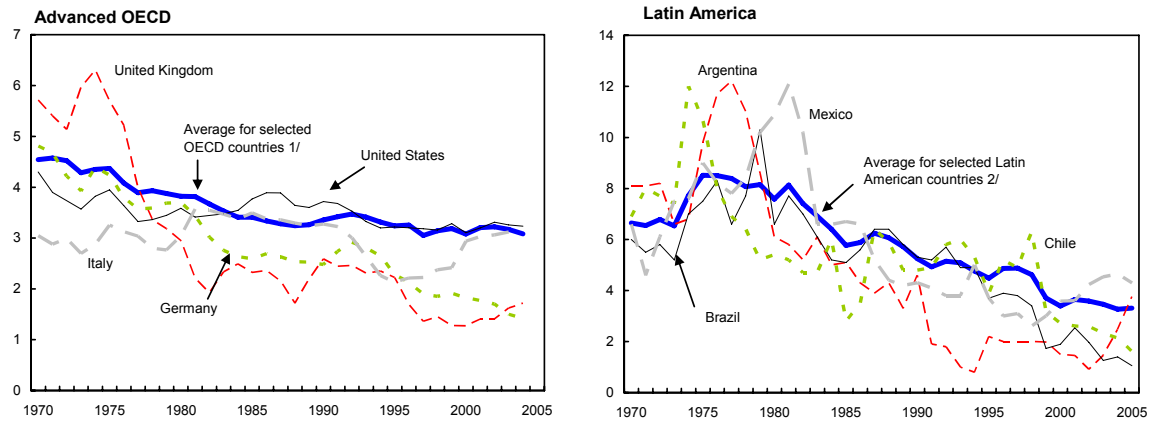
48. **The megaprojects should not jeopardize fiscal and external stability.** Based on the authorities' plans to contain current expenditure and improve tax revenues, the megaprojects should fit within the authorities' fiscal framework without hindering debt sustainability. The projects are also consistent with external sustainability, but will contribute to the projected deterioration of the current account over the medium term.

49. **A number of stress tests were developed to examine the debt sustainability of the envisaged public investment plans over the medium term.** A baseline scenario inclusive of the megaprojects is calculated to assess the evolution of the public debt relative to GDP until 2011. The sensitivity of debt dynamics to interest rates, exchange rates, and growth later is examined.

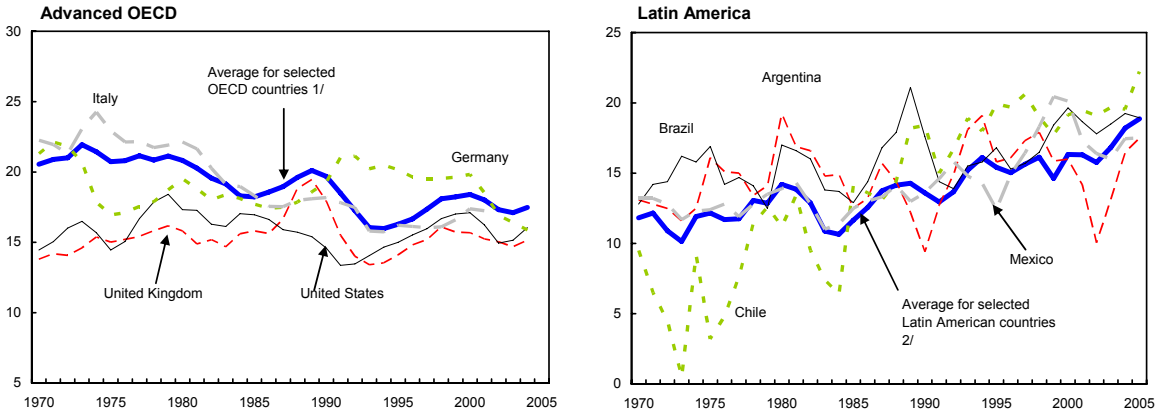
50. **In the baseline scenario, the public debt-to-GDP ratio inclusive of the megaprojects continues to decline over the medium term.** Owing to strong growth and continued primary surpluses, public debt is projected to decline to about 33.5 percent in

Figure 2. Investment Trends in Advanced OECD and Latin American Countries, 1970–2005
(In percent of GDP)

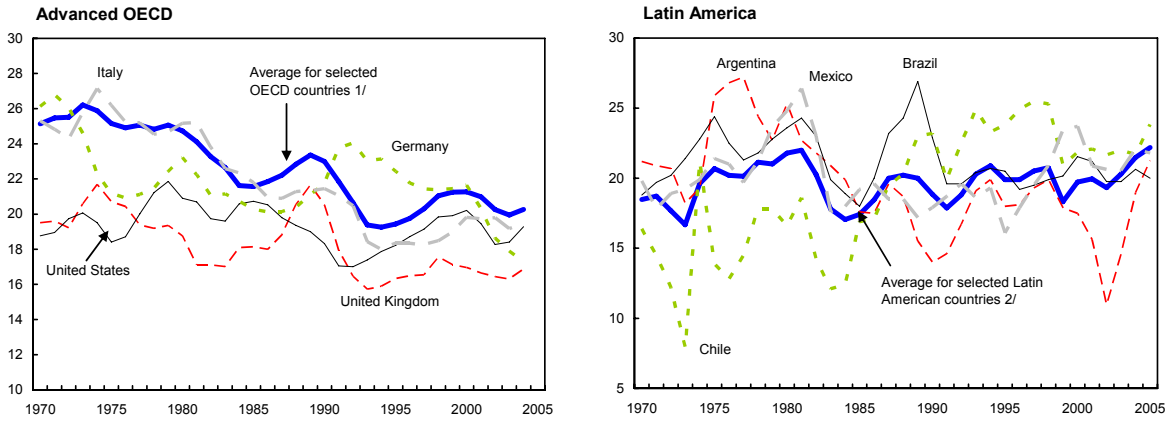
Public Investment



Private Investment

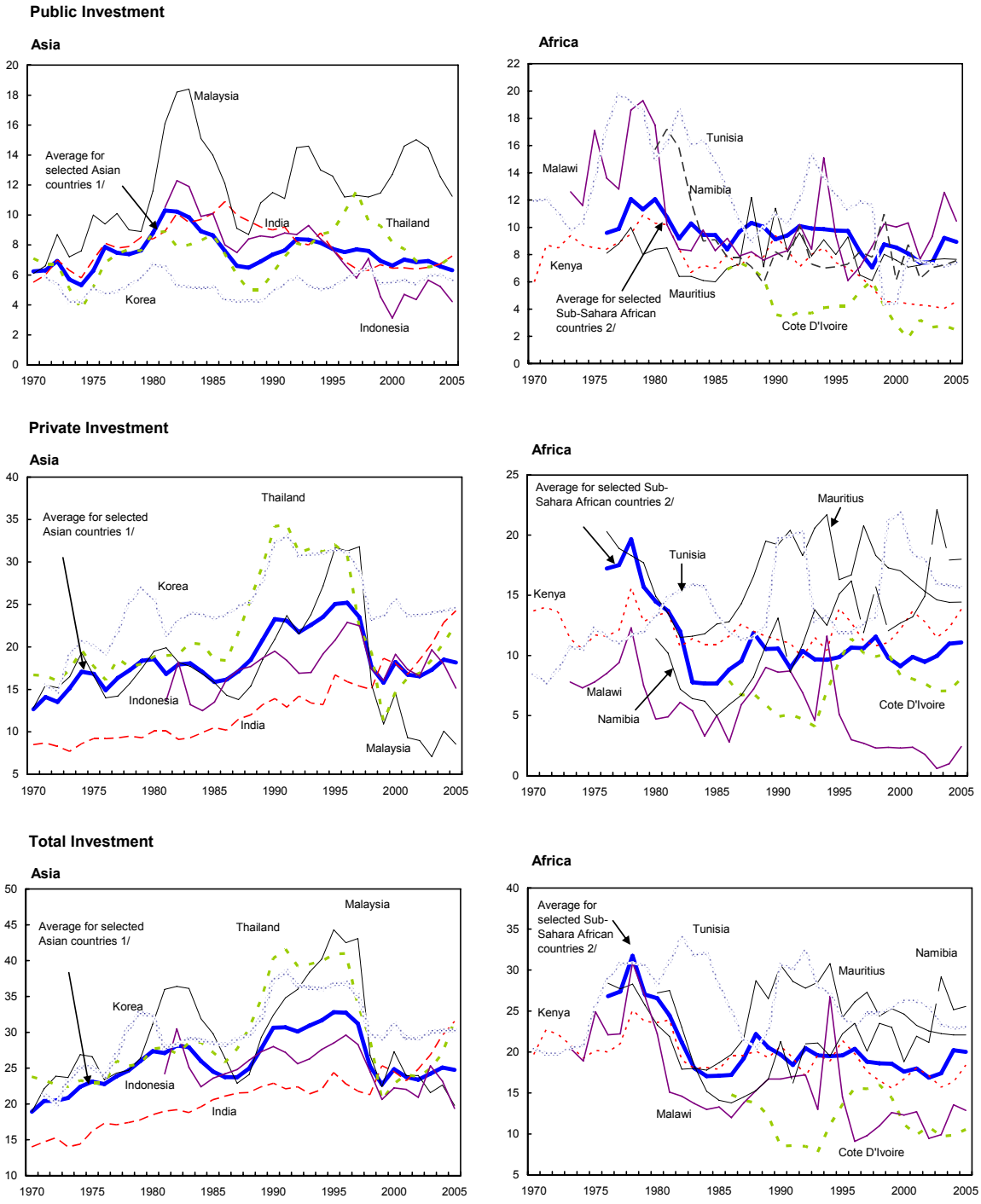


Total Investment



Source: International Finance Corporation, OECD and WEO database.
1/ Unweighted average for Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Norway, Portugal, Spain, Sweden, United Kingdom, and United States.
2/ Unweighted average for Argentina, Brazil, Chile, Colombia, Ecuador, and Mexico.

Figure 3. Investment Trends in Selected Asian and African Countries, 1970–2005 (in percent of GDP)



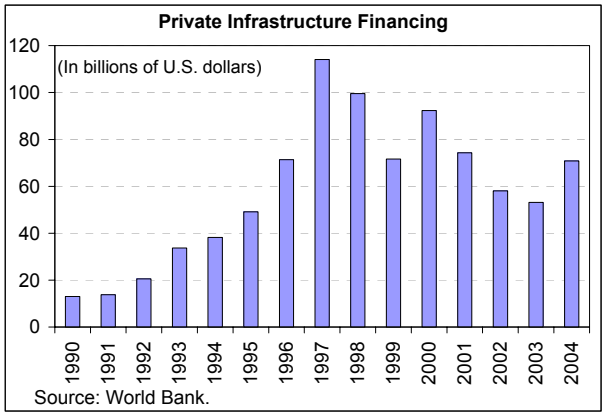
Source: International Finance Corporation and WEO database.
1/ Includes unweighted average of Bangladesh, China, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, and Thailand.
2/ Includes unweighted average of Benin, Cote D'Ivoire, Guinea-Bissau, Kenya, Madagascar, Malawi, Mauritania, Mauritius, Namibia, and Seychelles. Average is reported for 1976-2000, due to incomplete data prior to 1976.

2011. The cumulative contribution is projected to reduce the debt-to-GDP ratio by 13.1 percentage points through 2011. In addition, over the medium-term growth in Thailand is expected to converge towards its potential rate of about 5.5 percent; this also has a strong impact on reducing debt ratios.

51. **As the stress tests illustrate, the profile of public debt remains favorable in the face of shocks to the baseline.** The worst debt-to-GDP ratio of 41 percent is projected under the historical scenario, although this outcome is an artifact of the crisis years when variability of key macroeconomic variables rose. The rest of the scenarios, which include shocks to GDP growth, interest rate, contingent liabilities, exchange rate, and a combination of the above, generate broadly similar debt-to-GDP ratios which remain below 40 percent.

E. Financing Options

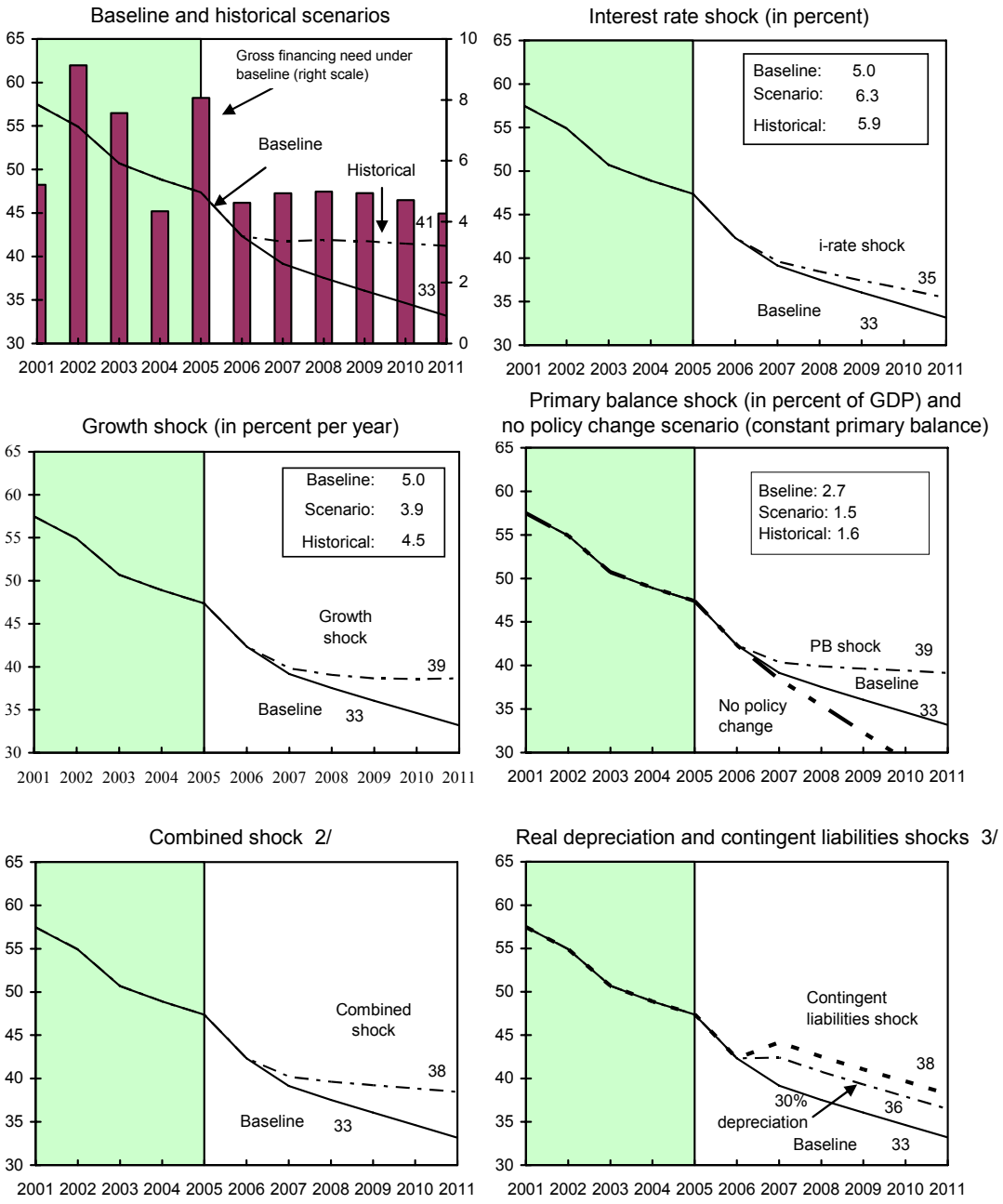
52. **Traditionally, most investment in infrastructure in developing countries has been publicly funded.** The public sector has provided about 70 percent of total spending; the private sector has contributed roughly 20-25 percent, while official development assistance has financed only around 5 to 10 percent. Towards the end of the 1980s, development assistance and aid agencies started to encourage private sector investment in infrastructure. As a result, private infrastructure financing accelerated especially in the developing countries in the late 1990s. This trend was abruptly reversed and total private sector project commitments plummeted from the 1997 peak of US$ 114 billion to US$ 50 billion in 2003, although they recovered somewhat in 2004.



53. **Policy options for increasing public saving to finance public investment in infrastructure depend on country-specific circumstances.** In general, countries should avoid ad-hoc revenue or expenditure measures that cannot (for political reasons) or should not (because of economic efficiency or equity concerns) be sustained over the medium term. In most cases, durable increases in public savings can only be achieved through reforms that broaden the tax base, raise efficiency in tax collection and reduce tax evasion, reduce budget rigidities, rationalize the civil service and social security systems, and strengthen public expenditure management. A recent IMF pilot study[24] points to three main types of situations:

[24] Public Investment and Fiscal Policy—Lessons from the Pilot Country Studies (www.imf.org).

Figure 4. Thailand: Public Debt Sustainability: Bound Tests 1/
(Public debt in percent of GDP)



Sources: International Monetary Fund; country desk data; and Fund staff estimates.
1/ Shaded areas represent actual data. Individual shocks are permanent one-half standard deviation shocks. Figures in the boxes represent average projections for the respective variables in the baseline and scenario being presented. Ten-year historical average for the variable is also shown.
2/ Permanent 1/4 standard deviation shocks applied to real interest rate, growth rate, and primary balance.
3/ One-time real depreciation of 30 percent and 10 percent of GDP shock to contingent liabilities occur in 2006, with real depreciation defined as nominal depreciation (measured by percentage fall in dollar value of local currency) minus domestic inflation (based on GDP deflator).

- **In countries with an already high tax effort**, increased public saving should come first and foremost from reducing current expenditure. A case in point is Brazil, where further structural reforms are needed to facilitate a sustainable reduction of current spending.
- **In countries with a comparatively low tax effort**, increases in public saving should be achieved by a combination of tax and expenditure measures. In India, for example, general government revenue is low by international standards. While revenue measures to broaden the tax base and further strengthen tax enforcement are important, efforts to contain current spending should focus especially on rationalizing poorly targeted subsidies and moderating the growth of the civil service wage bill.
- **In low-income countries**, it is often not obvious that public investment should take precedence over current spending. Ethiopia, for example, has very large investment needs in infrastructure, but it also has urgent current spending needs in the education sector and the health care sector. Improving the quality of public primary education and public health care would probably require higher current spending (to employ more teachers, doctors, and nurses), even after allowance for needed efficiency gains in these areas. Overall, it is not clear whether infrastructure investments as such would have higher returns than current spending, and it seems likely that these will have to go hand in hand, to avoid creating new bottlenecks to economic growth.

54. **However, private participation is becoming an increasingly popular option to finance provision of infrastructure services.** In the face of stringent budget constraints and scarce public funds, private participation, including through PPPs, can be an attractive option for the provision and financing of infrastructure.

55. **The private sector can raise financing for PPP investment in a variety of ways.** Where services are sold to the public, the private sector can go to the market using the projected income stream from a concession (e.g., toll revenue) as collateral. The government may also make a direct contribution to project costs. This can take the form of equity (where there is profit sharing), a loan, or a subsidy (where social returns exceed private returns). The government can also guarantee private sector borrowing.

56. **PPP financing is often provided via special purpose vehicles (SPVs)**. An SPV is typically a consortium of banks and other financial institutions, set up to combine and coordinate the use of their capital and expertise. Insofar as this is their purpose, an SPV can facilitate a well-functioning PPP. However, an SPV can also be a veil behind which the government controls a PPP either via the direct involvement of public financial institutions, an explicit government guarantee of borrowing by an SPV, or a presumption that the government stands behind it. Where this is the case, there is a risk that an SPV can be used to shift debt off the government balance sheet. Private sector accounting standards require that an SPV should be consolidated with an entity that controls it; by the same token, an SPV that is controlled by the government should be consolidated with the latter, and its operations should be reflected in the fiscal accounts.

57. **Where a government has a claim on future project revenue, it can contribute to the financing of a PPP by securitizing that claim.** With a typical securitization operation, the government would sell a financial asset—its claim on future project revenue—to an SPV. The SPV would then sell securities backed by this asset to private investors, and use the proceeds to pay the government, which in turn would use them to finance the PPP. Interest and amortization would be paid by the SPV to investors from the government's share of project revenue. Since investors' claim is against the SPV, government involvement in the PPP appears limited. However, the government is in effect financing the PPP, although recording sale proceeds received from the SPV as revenue mask this fact.

F. PPPs and Public Investment

General considerations

58. **Well-structured and implemented PPPs[25] offer the prospect of sizeable efficiency gains in the construction of infrastructure assets and the provision of infrastructure-based services.**[26] PPPs have been often praised as a third way between public provision of goods and services and privatization. Substituting private firms for public provision may bring many potential benefits, including saving scarce public funds, relieving strained budgets, and managing and maintaining infrastructure more efficiency. However, key requirements for success in this regard are that: the quality of services be contractible; there be competition or incentive-based regulation; there be adequate risk transfer from the government to the private sector; the institutional framework be characterized by political commitment, good governance, and clear supporting legislation; and the government be able to effectively appraise and prioritize public infrastructure projects, and correctly select those that should be undertaken as PPPs.

59. **While PPPs can ease fiscal constraints on infrastructure investment, they can also be used to bypass spending controls, and to move public investment off budget and debt off the government balance sheet.** If this is the case, the government can be left bearing most of the risk involved in PPPs and facing potentially large fiscal costs over the medium to long term.

60. **From a microeconomic perspective, PPPs have also been associated with a high incidence of contract renegotiations leading to many undesirable consequences.** The biggest problem with PPPs has been the high incidence of contract renegotiations shortly after their award. While, in principle, renegotiation can be a positive instrument when it

[25] While a PPP is usually characterized by a design-build-finance-operate scheme, the term PPP is commonly used to refer to a wider set of arrangements, including ones that involve only operating an existing government-owned asset (concessions). For the purposes of this paper, we will take the broader definition of the PPPs and will use PPPs and concessions interchangeably.

[26] See IMF (2004).

addresses the inherently incomplete nature of concession contracts, it has also undermined the competitive auction allocation process, consumer welfare, and sector performance. In some countries, renegotiation practices have increased public opposition to private participation in infrastructure and compromised the credibility of the desired structural reform program in infrastructure.

Country experiences with PPPs and concessions

61. **Latin American and Caribbean nations provide an excellent case study for country experiences with PPPs and concessions.** While the United Kingdom was the pioneer in using PPPs for a wide variety of infrastructure projects, Latin American and Caribbean countries have resorted to concessions for many public investment projects since the mid-1980s. In particular, Mexico and Chile have well-established PPPs, and a PPP-centered proposal for a regional approach to infrastructure development has been advanced in Latin America. The relatively longer experience of these countries with rewarding concession contracts and the closer match in development levels with Thailand makes them a better case study for learning about PPPs and concessions than developed nations.

62. **As was already emphasized, possibly the biggest problem with concessions has been the high incidence of contract renegotiation.** The table below provides a summary statistics of concession renegotiation in more than 1000 concessions granted in Latin American and Caribbean countries during 1985–2000. Renegotiation was very common in the sample, occurring in 30 percent of them. Renegotiation was even more pronounced in transportation and water projects, occurring in 55 and 74 percent of the cases, respectively. Excluding concessions in the telecommunications sector raises the incidence of renegotiations to almost 42 percent. That renegotiation was far less common in telecommunications and electricity projects may be explained by the more competitive nature of these sectors.

Incidence of Renegotiation
(Latin America and Caribbean, 1985–2000)

	Total	Total 1/	Electricity	Transport	Water
Percentage of renegotiated contracts	30.0	41.5	9.7	54.7	74.4

Source: Guasch (2004).

1/ Excludes telecoms.

63. **Most concessions were renegotiated very soon after their award.** The average time of renegotiation was only 2.2 years. Renegotiations came most quickly in water concessions, occurring an average of 1.6 years after the concession award. Renegotiations of transportation concessions took place after an average of 3.1 years. Moreover, the variance in the distribution of renegotiation periods was small, with 85 percent of renegotiations occurring within 4 years of concession awards and 50 percent within 3 years.

Average Time to Renegotiation since Reward
(Latin America and Caribbean, 1985–2000, years)

All renegotiated contracts	Transportation sector	Water
2.2	3.1	1.6

Source: Guasch (2004).

Variance of Time Distribution to Renegotiation
(Latin America and Caribbean, 1985–2000)

Time distribution to renegotiation	Percentage of renegotiated contracts
Within first 4 years after reward	85
Within first 3 years after reward	60

Source: Guasch (2004).

64. **There are many reasons why contracts are renegotiated.** In a broad sense, problems with concessions occur when efficient performance—as reflected in service costs, access, quality, and operator returns—is undermined by poor decisions and actions at the design stage, including inadequate attention to political and institutional issues, and government tolerance of aggressive bidding, or after the contract award when governments do not honor contract clauses and change the rules of the game. In addition, an improper regulatory framework and poor regulatory oversight increase the chances of conflict, rent capture by operators, or opportunistic behavior by government. Finally, external shocks, although an exogenous factor, can also significantly affect the financial equilibrium of a concession and induce renegotiation.

65. **One particularly pervasive driver of renegotiation has been the fixed-term nature of concession contracts.** Under the fixed-term contracts, government fixes the term of the contracts, and the concession is awarded to the firm that offers to charge the lowest user fee. Inherently such contracts expose the operator to considerable demand risk, which raises the possibility of renegotiation and implicit government guarantees. Demand risk arises when demand forecasts are unreliable. This risk is usually compounded when operators have limited flexibility to adapt to unforeseen demand scenarios, as is the case in many types of infrastructure projects, in which investments are large relative to the size of the market, and tied to a particular location.

66. **The least present value of revenue (LPVR) provides a viable alternative to fixed-term contracts.** The most distinctive feature of the LPVR is that the concession term is variable, adjusting automatically to realized demand (Box 1). This reduces the need for renegotiations and minimum income guarantees.

G. Summary and Policy Implications

67. **Medium-term growth prospects in Thailand hinge on pushing through with the megaprojects.** Given the widely recognized need to upgrade infrastructure and relieve transportation bottlenecks in order to spur medium-term growth prospects in Thailand, the planned megaprojects—especially with regard to the mass transit rail system, and water and irrigation projects—seem warranted.

Box 1: Fixed-Term Contracts versus Flexible-Term Contracts

Fixed-term contracts, which have been the main avenue to award infrastructure projects, suffer from a number of shortcomings:

- **The operator assumes a large fraction of the demand risk.** The main defect of fixed-term mechanisms is that the operator is exposed to a significant demand risk, arising from the uncertain nature of demand forecasts. Since returns are uncertain, operators will ask for a risk premium—usually paid by users—so that profits made if outcomes are good more than compensate for losses when bad outcomes materialize. As a result, financiers have refused to participate in auctions unless governments pledge minimum income guarantees.

- **Fixed-term contracts increase the demand for renegotiation and minimum income guarantees.** First, they increase the likelihood the best bid will be made by the firm that is most optimistic in predicting future demand for the infrastructure, since optimistic estimates lead to aggressive bids when the term of the contract is fixed. Second, fixed-term contracts encourage underbidding by firms that are good renegotiators and lobbyists.

Fixed-term contracts have one important virtue: they provide a powerful incentive to increase demand, since the operator appropriates the marginal income generated by its effort. This is particularly relevant when demand is elastic.

The LPVR auction aims at redressing some of the shortcomings of the fixed-term contracts:

- **The LPVR auction reduces demand risk.** Most importantly, by making the length of the contract responsive to demand, the LPVR significantly reduces the demand risk borne by the operator. The term expands when demand grows more slowly than expected and shortens when it grows more rapidly than expected. Since ultimately operators receive similar amounts whether demand outcomes are better or worse than estimated, the risk premium required by the operators is smaller, and users pay less in expected value over the life of the contract.

- **The LPVR auction eliminates the winner's curse.** It reduces the chance that the firm making the most optimistic demand estimate falls victim to the winner's curse, because the impact of demand forecast errors is smaller. When the term of the contract is fixed, an optimistic demand estimate translates into an aggressive bid. In contrast, under the LPVR, winning the auction by being too optimistic will only extend the term without affecting the total amount of revenue. In effect, the LPVR transforms demand-oriented into cost-oriented bids.

- **The LPVR auction creates limited scope for opportunistic renegotiations and minimum income guarantees.** Common forms of renegotiations are ineffective as raising user fees has the effect of shortening the contract but does not increase the operator's revenues. Contract extensions are meaningless as by definition the contract term is variable. LPVRs also preempt needs and requests for minimum income guarantees, with their corresponding fiscal implications.

- **The LPVR auction allows for fair compensation to be easily determined.** LPVRs provide clear and transparent compensation in the event that the contract has to be terminated or modified, and lessen the possibility of lengthy and protracted negotiation between the operator and the government while trying to determine a fair compensation.

The LPVR has also some disadvantages. The main disadvantage is that the operator has less incentives than under a fixed-term contract to increase demand since this would not change the overall amount of revenue that is to be collected. In addition, since the length of the contract is uncertain, financing might be more difficult to obtain. Finally, while there is no need to agree on the length of the term, governments and operators still have to agree on the proper discount rate.

68. **The significant amount of infrastructure spending, however, requires that the authorities implement the megaproject initiative without jeopardizing fiscal and external stability.** Future budgets should accommodate the megaprojects without putting excessive pressures on public finances, inflation, and the external balance. Therefore, it is crucial to implement the projects in a transparent and efficient manner, giving proper consideration to avoiding cost overruns and ensuring rigorous selectivity.

69. **Macroeconomic sustainability can be safeguarded in a number of ways.** First, public investment increases should be limited to amounts that remain consistent with a moderate or declining debt-to-GDP ratio over the medium term under a meaningful range of stress-test scenarios. Second, increases should be concentrated on high-priority and high-return projects in bottleneck sectors. Identifying such projects usually requires strengthening technical capacities to evaluate and prioritize potential projects. Third, complementarities between different infrastructure and noninfrastructure investment need to be taken into account, when increasing or reprioritizing public investment spending. Fourth, sound cost-benefit analysis will often suggest that it is preferable to invest in the rehabilitation and upkeep of existing infrastructure rather than in new projects, which may have greater political appeal. Also, in most cases priority should be given to the timely completion of ongoing projects, rather than the initiation of new ones, as interruption or delays in the execution of investment tend to result in cost overruns. And, finally, in assessing the appropriateness of new investment, it is important to take into account the recurrent costs involved in the operation and maintenance of completed infrastructure.

70. **Public investment plans should be financed through a mixture of increased public saving and higher private sector involvement.** Thailand is a country with a moderate tax effort, which indicates that increases in public saving should be achieved through a mixture of tax and expenditure measures. The government has to strive as well to create an environment conducive to a more pronounced private participation in the provision of public infrastructure services, including through a well-structured PPP program.

71. **If the preferred way of implementing the megaprojects is PPPs, the main policy challenge will be to design a PPP program that minimizes the incidence of renegotiation.** PPPs have promised to save scarce public funds while reaping the benefits of private participation in the provision of public goods. Still, the results that the PPPs have produced around the world have led many to question their advantages. In particular, the high incidence of renegotiations and the provision of minimum income guarantees have burdened public finances and, to some degree, shaken the belief in PPPs.

72. **LPVR auctions should be the preferred option for rewarding PPP contracts.** LPVR auctions alleviate the demand risk inherent in the fixed-term contracts and thus eliminate a key driver for renegotiations and the provision of minimum income guarantees. In addition, they make straightforward a fair compensation of operators in the event of modification or an early termination of the contract. Because LPVR auctions might provide

less incentives to increase demand relative to fixed-term contracts, they need to be complemented by institutions that determine and enforce minimum quality standards.[27]

73. **Regulators should be independent of the agency in charge of awarding contracts.** Often the agency that has been in charge of awarding the contracts has also taken the role of supervising them. This has created significant tension between the pressure to bring the project to successful completion—even if this amounts to renegotiating the contract or granting minimum income guarantees—and the necessity to enforce the proper execution of the project by the operator. It is, therefore, imperative that planning and procurement be divorced form regulation and enforcement, and that the latter be placed in the hands of an independent agency.

74. **Governments have a key role to play in the process.** Even though the very idea of the PPPs is to strengthen private sector participation in the provision of infrastructure services, governments should remain involved in the whole process. In particular, public planning of networks and infrastructure development is necessary, even when private firms propose individual projects. In addition, governments have an essential role in conducting rigorous social cost-benefit analyses of infrastructure projects.

[27] See Tirole (1997).

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IV. Financial Sector Developments and Issues[28]

A. Introduction

75. **A decade after the financial crisis, Thailand's financial sector has seen steady improvement in resilience, efficiency, breadth, and depth.** The banking sector has benefited from strong economic growth, consolidation and recapitalization efforts, improved risk management, and operational restructuring. In addition, banking regulations and oversight have been strengthened. Initiatives have been introduced to deepen and broaden domestic capital markets.

76. **The core challenges going forward are to consolidate these achievements while pushing on with reforms aimed at further strengthening the role of markets.** This would involve deeper institutional reforms and liberalization measures. It would also include strengthening regulatory oversight to international best practice standards, and forcefully resolving the legacy problems that are still hampering banking soundness. The next section reviews recent developments in Thailand's financial sector before discussing the main long-term challenges facing the sector.

B. Developments—Structure, Resilience, Breadth, and Depth

Banking sector

Structure

77. **The structure of the banking sector has changed markedly since the 1997 financial crisis** (Figures 1 and 2). This reflects a host of factors, including (i) large scale government intervention to restore stability through bank recapitalization, closure, and mergers; (ii) private bank recapitalization, resulting in ownership dilution; (iii) market opening measures to allow for more foreign competition; and (iv) more recently, the consolidation achieved through the implementation of the Financial Sector Master Plan (FSMP) in 2005.[29]

78. **As such, the number of financial institutions has declined sharply from 135 at end-1996 to 43 at end-September 2006.** However, most of the consolidation was among finance companies, with over 50 finance companies closed during the1997 financial crisis, and with very little among banks. Despite the relative large number of commercial banks, the sector is concentrated, with the top five accounting for just over half of banking assets at

[28] Prepared by Jeanne Gobat.

[29] The financial sector master plan (FSMP) allows for two types of banks—commercial and retail banks. Finance companies and credit fonciers can merge and convert to banks or alternatively become nonbanks.

end-2005. While foreign banks are playing a more important role, they continue to face limits on the number of branches and on ownership.[30]

79. **The government's role in financial intermediation increased sharply over the past decade, largely because of intervention during the financial crisis.** In recent years, its participation has declined through sales of intervened banks to the private sector, including foreign investors, as well as share dilution as a result of bank's recapitalization efforts. As a result, banks with significant government ownership accounted for over one-fifth of total banking assets at end-2005.[31] If deposit-taking special financial institutions (SFIs) are included, the government's share would rise over 40 percent.[32]

Profitability

80. **Banking profitability strengthened in 2005 and through 2006 despite a more challenging operating environment** (Figure 3). While loan growth slowed, profitability was helped by rising net interest rate margins and strong noninterest income. The latter has increased as result of banks' ongoing efforts to diversify their revenue sources. Noninterest expenses have been kept in check, reflecting improved operational efficiencies from IT related investments and greater competition. However, large provisioning continues to act as drag on profitability. Although performance was strong across most banks, there are a few midsized banks reporting low profitability and capital.

Developments in bank lending

81. **Lending growth has moderated as borrowers became more sensitive to higher interest rates, weaker domestic demand, and general uncertainty.** Consumer lending also slowed as tighter prudential regulations took effect.[33] Consumer bank loans now account for

[30] The Banking Act was amended in 1997 to allow foreign entities to hold shares in Thai financial institutions in excess of 49 percent for ten years. After 2007, additional shares purchased must amount to less than 49 percent. Invested amounts during 1997−2007 are grandfathered.

[31] By end-1999, the government sold three out of the six banks taken over by the Financial Institutions Development Fund (FIDF) during the crisis to foreign investors.

[32] The four deposit taking SFIs include Government Housing Bank (GHB), Government Savings Bank (GSB), Bank of Agriculture and Agricultural Cooperatives (BAAC), and Islamic Bank of Thailand. The main depositors are the government, state-owned enterprises (SOE), civil servants and also small savers. The GHB and GSB are the sixth and eight largest banks respectively in terms of assets and deposits. These SFIs were set up to carry out the government's social and economic development policies, in particular with regard to credit extension to small- and medium-sized enterprises, households, local governments, and rural areas. Deposit-taking SFIs are regulated by the Ministry of Finance (MOF) and their respective ministries, although the Bank of Thailand (BOT) conducts annual on-site examination. They benefit from both regulatory and tax advantages.

[33] Between 2002 and 2005, the BOT introduced (i) regulations on minimum monthly income and debt repayments; (ii) limits on interest rate charges on credit card for both banks and nonbanks; (iii) stricter debt repayment and credit line rules for consumer loans; (iv) maximum loan-to-value ratios for mortgage loans; and

(continued)

20 percent of total loans, up from 10 percent a decade ago, with collateralized housing loans accounting for two-thirds of the total. While the rise in consumer lending has led to higher household debt, it is still low (about 26 percent of GDP, with debt service amounting to about 2−3 percent of income). Still, some lower income households are more highly leveraged and would be sensitive to any downturn.

82. **Despite the steady growth in bank lending since 2001, the share of bank credit in the economy remains below crisis levels.** Bank credit has declined to 80 percent of GDP at end-2005 from 128 percent at end-1997. Most of this can be accounted for by sharply lower nonfinancial corporate borrowing and technical factors such as nonperforming loan (NPL) sales to asset management companies (AMCs) and write-offs. Corporate disintermediation has been partially offset by borrowing through capital markets. In 2005, Thai companies raised a total 25 percent of GDP on the local capital markets. Companies are also relying on strong internal earnings to fund themselves.

Asset quality and capital adequacy

83. **While the quality of bank assets has improved, the level of distressed assets (NPLs and foreclosed assets) in the banking system remains still high and continues to pose a risk to banks.** Sounder corporate finances, a more balanced asset structure, and improved risk management have enhanced asset quality. This has led to a decline in NPLs, which have fallen to 7.5 percent at end-2006. Nevertheless, NPLs remain high—among the highest in the region—with the bulk of the NPLs concentrated in the manufacturing sector. Total distressed assets in the banking system account for about 17.5 percent of bank's total loans, if restructured loans were included. Most banks, however, maintain high loan loss reserves and also are sufficiently capitalized, with the averaged capital adequacy ratio for the banking system—at 14 percent—above the regulatory minimum.

84. **Several factors account for the slow progress in dealing with NPLs.** This includes: (i) reclassification of restructured loans to NPLs; (ii) legacy issues, with about 40 percent of NPLs related to protracted court cases; and (iii) new NPLs, although modest in increase.

85. **In mid-2006, the BOT announced a number of steps to accelerate the resolution of distressed assets in the banking system and to improve loan classification and provisioning practices.** The state-owned Bangkok Commercial Asset Management (BAM) is expected to buy NPLs and NPAs from all banks. More importantly, the BOT will introduce IAS 39, applying discounted cash flow and fair market valuation to loans.[34] This

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(v) regulations on unsecured personal loans for both banks and nonbank financial institutions, with credit limits set as a percentage of monthly income.

[34] Under the new standard, which will be gradually applied at end-2006 and over 2007, loan-loss provisions will be made by comparing the carrying amount of a loan with the net present value of the estimated discounted cash flows of the loan.

change should create incentives for bank to reduce their distressed assets. The BOT's aim is to lower system-wide NPLs net of provisioning to 2 percent by end-2007.

Liquidity and market risks

86. **Banks continue to be highly liquid with the loan-deposit ratio at only 86½ percent.** They also continue to hold significant excess reserves. Deposits have risen in response to higher rates while loan growth has stagnated. The blanket government deposit guarantee along with improved banking soundness has helped underpin confidence in the banking system.

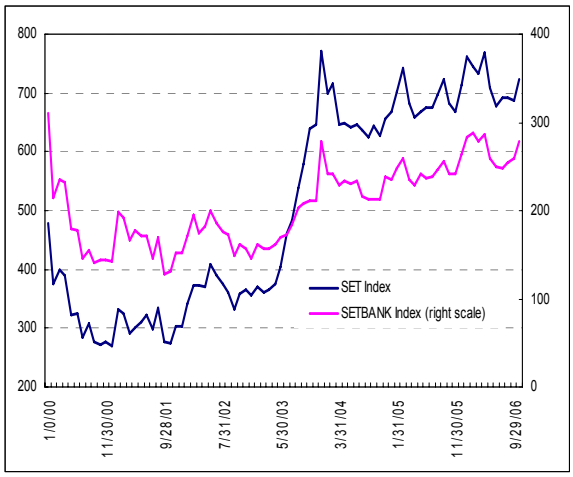
87. **Market risks also do not appear to pose a significant risk to Thai banks.** Banks, for instance, have not been much affected by market volatility in 2006.[35] Most of banks' holdings of securities are in government securities, and are hedged through interest rate swaps or otherwise held to maturity. In addition, prudential regulations limit banks' securities holdings and banks are also required, as of end-June 2005, to hold capital against market risk.

Regional comparison

88. **Developments in Thai financial soundness indicators are comparable to other regional banks.**[36] Nevertheless, when comparing individual performance among the largest banks in the region, the large top-tier listed Thai banks lag somewhat in financial performance. (Figure 4).

Market indicators

89. **Market indicators support the relatively benign view of prospects for the banking system, although ratings suggest continued fragilities.**



- Share prices for listed banks have outperformed the overall index since the beginning of 2006. The relative good performance despite a challenging environment likely reflects improvements in banking fundamentals, sufficient liquidity, and overall positive prospects going forward. Bank valuations are higher than that of the overall market.

[35] A more detailed assessment of banks' vulnerabilities to market risks and contagion is being done in the context of the FSAP.

[36] Generally, however, cross-country comparisons are difficult because the application of different accounting, prudential, and enforcement standards.

- Overall, Thai banks' credit ratings remain low. This is visible in the D rating in Fitch's Banking System Index or high industry risk rating in Standard and Poor's (S&P) Asia Pacific Banking outlook.[37] Rating agencies cited a number of factors holding back ratings, including high NPLs and restructured loans and an unfinished legal and regulatory reform agenda.

Fitch: Banking System Risk Matrix

Country	Bank Ratings 1/	Macro-Prudential Indicator 2/
Thailand	**D**	**1**
Hong Kong	B	1
Indonesia	D	1
Japan	D	1
Korea	C	1
Malaysia	C	1
Philippines	D	1
Singapore	B	1

1/ Bank scale rating A–E, with A highest score.
2/ Rating of macroeconomic environment, with 1 highest rating of scale 1–3.

- Distance to default indicators (DDs)[38] shows that the risk profile for local banks listed on the SET has not deteriorated compared to 2005 (Figure 5). There was some temporary downward trend in first quarter of 2006, but the DDs of all listed banks increased in the second half of 2006. The system on the whole is stable with banks showing a trend improvement in DDs over recent years.

Near term outlook and risks

90. **Given the positive economic outlook, sufficient liquidity and improved earnings capacity, the outlook for the banking sector is generally positive.** However, weaker growth and investment could increase credit risks and dampen loan demand. Near-term pressures are also increasing as a result of greater competition and regulatory changes (e.g., the movement to IAS 39 and preparation for Basel II). The adoption of IAS 39 is expected to curb profits as banks will need to set aside higher provisions. The introduction of the capital controls in December 2006, if not temporary, could also impact the funding costs of smaller banks and foreign branches as these rely more on markets for funding. Overall, however, the banking system is more resilient and better positioned to weather shocks than a decade ago.

[37] The Fitch rating measures the strength of the banking system, based on individual ratings of the core banks in the system (asset-weighted average). It abstracts from potential government or private support.

[38] DDs combine data on the market value of assets, its mean, and its volatility into a composite measure that indicates risk of defaulting for a bank. For each bank, the DDs are constructed using daily 2005 data for market value of equity and the end-2005 book value of liabilities. The market value of equity is viewed as the call option on banks' assets, with a strike price equal to the current book value of liabilities. The DDs figure shows the number of standard deviations the market value of assets has to deviate from the mean in order for default to occur. An increase in DDs signifies lower risk. The DDs on individual banks are averaged to yield the system wide DDs for Thailand.

Financial markets

Structure

91. **Local capital markets are playing a greater role in mobilizing and channeling savings, developing risk instruments, and in providing competition to the banking sector** (Figure 6).

- The Thai bond market is now the fourth largest in Asia (outside Japan). It is dominated by government paper: while central government issuance of longer-term debt has declined due to the budget surplus, this has been offset through issuance by the BOT, which accounted for half of public debt issuance in 2005. Public sector debt is largely held by local institutional investors, while commercial banks' share has declined and foreign holdings are small (less than 4 percent). Government savings bonds accounted for most of the issuance in the first half of 2006.

- While much of the corporate bond issuance in the immediate post-crisis period was dominated by banks, energy, transportation and property development companies are now accounting for greater share of issuance. Most of the issuance is dominated by high-quality/rated borrowers, and is either unsecured long-term paper or short-term commercial paper. The latter helps nonlisted companies tap the market.

- Similar to debt market trends, the equity market has increased fivefold since the financial crisis. The market valuation of the Stock Exchange of Thailand (SET) exceeds US$100 billion, and is the fourth largest stock exchange in Asia (excluding Japan). Encouraged by tax concessions in 2003, almost 100 companies have since listed on the SET. The top 10 listed companies account for more than half of total market capitalization and trading, with foreign investors being large holders of their shares. Turnover ratio is high compared to other exchanges in the region (second to Korea), reflecting also relatively low transactions costs and no capital gains tax on equities. On the other hand, the free float at 46 percent is relatively low, reflecting the government's high holdings of privatized companies and Thai companies' reluctance to further dilute ownership and control.

- The development of the capital markets has resulted in higher derivative transactions. Interest rate swaps outstanding have tripled in size in the past three years as market participants have been hedging in response to interest rate movements.

- Securitization is also picking up, primarily through the government, which issued its first asset backed security (ABS) in 2005 backed by lease income from a new government office project. Corporations have made very little use of ABSs or other structured products.

92. **A range of measures were introduced in 2006 to enhance market infrastructure and efficiency.** This includes: (i) an over-the-counter electronic real-trading platform for fixed income and related securities; (ii) a central securities depository for government securities by Thailand Securities Depository (TSD); (iii) securities lending and short sales; (iv) a requirement for bond dealers to report all trading transactions to the Thai Bond Market Association; (v) the ABF Thailand Bond index, making it the first exchange trade fund; and (vi) the Thailand Futures Exchange, with its first traded product—the SET 50 Index Futures.

93. **Both supply and demand factors have supported market development.** This includes (i) progressive deregulation of the securities industry to increase competition and diversify the system; (ii) banks and the government need to raise capital in the post-crisis period; (iii) improvements in corporate governance practices; (iv) tax incentives to spur demand for capital market products and asset management services and for corporations to tap the financial markets; (v) privatization of some profitable SOEs; (vi) the development of a yield curve in government debt securities; and (vii) improvements in the market infrastructure, including payment systems.

Performance

94. **Financial markets have been more volatile, reflecting broader political and global developments.** This included, in 2006, the political turmoil beginning in April, the EM correction of May–June, and the military coup in September. More recently, wide-ranging capital controls, the New Year's Eve bombings in Bangkok, and prospective changes to the foreign investment framework have weighed negatively on markets.

- Volatility in equity markets, interest rates, and the exchange rate was higher in 2006 compared to previous years.

- Sovereign risk indicators such as sovereign spreads and the five-year sovereign credit default spread edged up compared to 2005. Nevertheless, spreads and yields are near historic lows, reflecting Thailand's solid fundamentals and high global liquidity.

95. **The ease with which the financial sector has managed the recent shocks reflects strides made in strengthening economic management and financial sector resilience.** These include: a strong external position, high international reserves, low external debt burden, enhanced financial transparency, a flexible exchange rate regime, enhanced monetary credibility, improved risk management among financial institutions, and a more diversified and broader financial market. As such, Thailand's financial system is better positioned to insulate itself against a sudden sharp withdrawal of external capital.

C. Challenges—Building a Framework Supportive of a More Efficient and Diverse Financial System

96. **The core issues and challenges facing policymakers are to consolidate the significant achievements made to date, while pushing for reforms that will help achieve a more efficient and diverse financial system.** A well-functioning financial sector is characterized by resilience and depth, and underpinned by competition, sound risk management, strong corporate governance, a broad range of products and services, and innovation.

97. **What will be needed to foster greater efficiency and diversity gains in Thailand's financial system?** Given the importance of banks to the financial system, a key challenge is to ensure that banks are strengthening their risk management practices. To this end, supervisory oversight and prudential regulations will also need to be brought in line with international best practices. Regulation and supervision of nonbank financial institutions and capital markets also deserve special emphasis, given their growing importance. Furthermore, corporate governance practices, the quality of reporting, and the market infrastructure can be further strengthened. Consideration could be given to deregulating certain areas of financial services to encourage competition and market development. The government may also want to consider divesting its significant stake in the banking industry and expediting the sales of its holdings of nonperforming assets and restructured loans to the market. In addition, the role of SFIs should be examined to assure that it is consistent with market development and with SFIs' mandate. Of course, policymakers will need to be mindful of balancing the need for market development against that of ensuring financial stability.

Strengthening banks

Improving risk management

98. **A host of reforms are underway or in the pipeline to upgrade regulatory oversight, including through legislative reforms and the adoption of risk-based supervision.** The BOT and the SEC are encouraging local banks to further upgrade their risk management and governance practices. Recognizing the critical oversight role played by banks' Board of Directors and senior management in the risk management process, a Director's Certification Program was established in 1999 to provide directors with a better appreciation of their fiduciary responsibilities. A Director's Handbook was also published to guide directors of financial institutions on corporate governance matters. Furthermore, the BOT established corporate governance guidelines for banks, including fit and proper tests for directors and executives, and requiring the establishment of risk management, audit, credit risk, and asset-liability committees. Additionally, compensation and remuneration committees are also recommended. In parallel, the SEC introduced governance standards for company directors and executives. These in turn have to register with the SEC's Directors and Executive Registration Database.

99. **Banks have also begun implementing more modern risk management techniques.** This includes introducing internal rating systems, credit scoring models, and collecting debt and payment records from the national database of the Credit Bureau for credit default analysis.[39] Under the guidance of the BOT, local banks have separated marketing and sales departments from credit analysis departments. The larger banks are beginning to use internal credit ratings and loan pricing methods to assess their corporate lending. Banks are also upgrading their IT systems and risk management framework in anticipation of Basel II. All these measures, along with frequent application of stress testing should—if effectively implemented—help strengthen the resilience and efficiency of the banking system.

Reforming the regulatory framework

100. **Passage and implementation of a number of proposed legislative reforms would help improve regulatory oversight and enhance market discipline:**

- Amendments to the BOT Act are expected to strengthen the BOT's operational independence.

- The Financial Institutions Business Act (FIBA) is expected to strengthen the BOT's supervisory powers, including instruments available to address weaknesses in banks and coverage of institutions. Work is already ongoing to strengthen supervision on a consolidated basis.

- The new Deposit Insurance Agency Act (DIA) should help re-introduce more market discipline to the banking sector in the long run and put pressure on banks to improve their financial strength. The DIA Act would replace the current blanket deposit guarantee. The DIA will be phased in over four years to allow financial institutions and depositors to adjust to the new framework. A key issue will be to develop an effective communication strategy to build understanding among depositors.

101. **Adoption of Basel II is envisioned for end-2008.** The BOT has issued a series of consultative papers in 2005 on specific policies and guidelines relating to Basel II implementation.

[39] In 2005, the Credit Information Business Act was passed to strengthen the legal basis for creditors to share information. The act became effective in February 2006. In addition, the Thai Credit Bureau and the Central Credit Information Services were merged in 2005 to form the National Credit Bureau (NCB). NCB's credit database has now grown to more than 20 million accounts, covering more than 10 million customers. NCB collects and warehouses debt and debt service records and also compiles a negative list.

Moving towards risk-based supervision

102. **The BOT is upgrading its risk-supervisory and monitoring practices.** In preparing for Basel II, the BOT has developed a range of database and risk-management systems and a framework for cross-border supervision and training programs for supervisors. This includes the use of scenario analysis, the development of an early warning system on a bank-by-bank basis, and the publication of quarterly macro prudential indicators. The BOT has also issued five prudential guidelines to enhance banks' risk management practices: internal rating systems, credit risk management of loan portfolios, credit scoring, risk model validation, and credit and market risk stress testing.

Regulating SFIs

103. **Plans have been announced to strengthen prudential regulations governing SFIs.** The intent is to give the BOT the mandate to supervise these institutions and subject them to commercial banking prudential standards. There has been some concern that their regulatory advantages may have resulted in unintended distortions in the market.

Strengthening Financial Markets[40]

104. **While Thailand's financial markets are deeper and more developed when compared to countries with similar per capita income, bank financing is still the most important source of external financing.** The pool of capital market products continues to be limited while the secondary market for fixed income securities and equities remains shallow. Market activity is primarily retail driven, while institutional investors play a minor role.[41] Weaknesses in corporate governance practices still undermine market development.

Enhancing market infrastructure

105. **A well-functioning government securities market is critical to promoting capital market development and to lowering the government's borrowing costs.** A core challenge is to find ways to increase the volume of government debt on issue, including through consolidating outstanding issues to "on the run" issues coupled with exchanges or redemptions of existing small and irregular issues. Consolidating the various sovereign-related issuance activities (SOE guaranteed and central government) in a single government-borrowing program would help increase the volume of government debt and improve market

[40] The issues, priorities, and recommendations discussed in this section are drawn from the December 2005 IMF technical assistance mission on Capital Market Development and the January 2006 report by the Asian Development Bank—both of which reviewed and commented on the government's Capital Market Master Plan II.

[41] Retail investors account for about 25 percent of the SET's market capitalization and for 60 percent of market turnover, significantly higher than any other exchange in the region.

liquidity. Relaxing the complex and relatively stringent rules governing public debt management would also allow for more flexibility in debt and risk management, including in the context of budget surpluses, pre-financing, reopening, and tap issues. The role of primary dealers in making markets should be brought in line with best practice standards, including reviewing the possibility of giving them exclusive rights in the primary auctions and some liquidity support facility in return for being obligated to make markets. Finally, the government's cash management framework could be strengthened, in particular with regard to forecasting cash flows and financing requirements. Among others, this would help improve the credibility of the government's issuance plans, but also yield other benefits such as enhancing BOT's liquidity forecasting and management.

106. **A number of other reforms would help improve secondary market liquidity in government securities.** The BOT's changes to its repo facility in 2007 should help spur the private repo market. This would allow market participants to better hedge their positions and manage liquidity efficiently. Tax neutrality issues between bonds and equities also needed to be examined, with the current system favoring equities over debt.[42] Finally, consideration should be given to removing the special business tax entirely. Most countries have done away with this type of turnover tax as it tends to hinder secondary market trading.

107. **The government is also planning to reform the stock broking industry.** At present, the Thai stock broking industry is heavily regulated and protected. The commission rate is fixed at 0.25 percent, the number of brokers has been fixed for some time, and there are restrictions on the services and products it can provide. In general, the industry has done a poor job in contributing to capital market development. The reform plan is to gradually abolish the fixed commission rate, raise capital requirements, and liberalize the industry through free entry and greater competition.

Developing the investor and issuer base

108. **A broad base of investors, with different risk preferences and time horizons, and professional risk management capacity, is key to market development.** The government is reviewing a draft reform that proposes introducing a minimum social security system along with a mandatory provident fund system for all salaried employees of the private sector and those not covered by the Government Pension Fund. This would help broaden the coverage and make the system more affordable given demographic trends. If organized and managed in a decentralized fashion, similar to the one introduced in Hong Kong SAR, where individuals are allowed to choose from a selected list of private sector fund managers, a mandatory pension system could provide much needed impetus to demand and market development.

[42] Capital gains on bonds are taxed whilst equities are exempted. In addition, interest income is taxed at a higher rate than dividends.

109. **Market demand could be further stimulated by examining the current prudential regulations governing asset allocation for insurance and pension funds.** Insurance and pensions are subject to quantitative limits on their holdings of corporate bonds (by rating and sector), equities, and foreign assets. Because of a narrow domestic supply base and limited acceptable asset classes, funds are invested domestically and predominantly in government bonds, deposits, and cash, yielding a low return. As assets increase over time as a result of pension reforms and demographic reasons, these limits may be difficult to maintain and not necessarily prudent. Moving toward a risk-based regulatory framework for insurance or prudent man rules for pensions would help move away from a less prescriptive investment allocation regime. Of course, while liberalizing these regulations, caution would needed to ensure robust risk management and governance practices within the insurance and pension industries and an appropriate regulatory and supervisory framework.

110. **The government is also considering ways to attract a larger pool of issuers to the SET and to improve the float.** This is a difficult task as most companies in Thailand are family-owned and controlled, and prefer to use the bank or money market for financing. Or if listed, they maintain tight control through direct appointments of board members and distribution of shares among management and board members. Improving the protection of minority shareholder rights, including through strengthening the oversight role of the board and the independence of board directors may also help alleviate this problem.[43] Tax incentives could help attract companies to the SET. Indeed the SET has successfully used tax incentives over the past three years to this end. Privatization of profitable SOEs could also help expand the issuer base while divestiture of the government's outstanding shares of listed companies could also help improve the float in these companies. Finally, the SEC is also looking at reducing listing costs, which were identified as being higher than in other exchanges for the region.

111. **Securitization could help expand the supply of credit instruments and enhance risk management.** Although their high liquidity tends to dampen the need for securitizing loans, banks may find securitization useful to manage balance sheet risks in preparation for Basel II. Moving to IAS 39 may also help spur this. Securitization could also be used by the government as vehicle for selling the large stock of foreclosed assets and restructured loans held by state AMCs to the market. In many countries, securitization (e.g., receivables) has also been helpful in opening doors for SMEs to market-based financing.

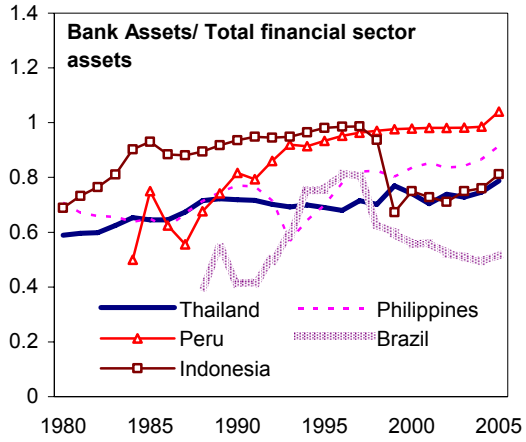
[43] In early 2004, Thailand participated in the Report on the Observance of Standards and Codes (ROSC) of its corporate governance standard. Among the ROSC's main recommendations were (i) upgrade the legal and regulatory framework; (ii) improve enforcement of laws and regulations; (iii) make Thailand's accounting standards fully consistent with International Accounting Standards (IAS); and (iv) strengthen minority shareholder's rights. See the World Bank's Corporate Governance Assessment for Thailand, June 2005.

D. Summary

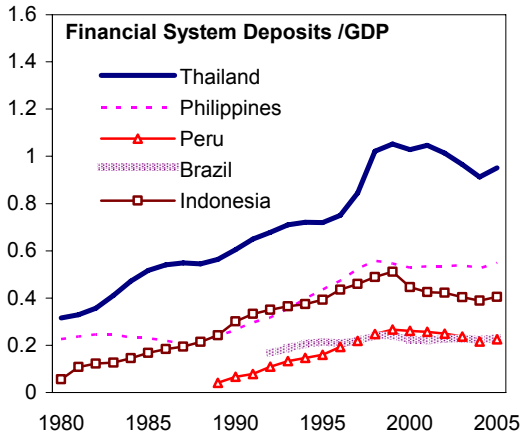
112. **Significant progress has been made in strengthening the financial system since the 1997 financial crisis.** Its resilience to domestic and external shocks has improved. Capital markets are also playing a more important role in the financial system. The authorities in Thailand are in the process of implementing a host of "second-generation" reform initiatives, including identifying gaps with global standards and designing a reform plan for both the banking sector and capital markets (i.e., the 2nd FSMP and the Capital Market Master Plan II). The forthcoming FSAP will also help identify existing gaps in the regulatory and supervisory framework and will help provide a roadmap for future reform.

Figure 1. Thailand: Financial Sector Compared with Other Selected Emerging Market Countries

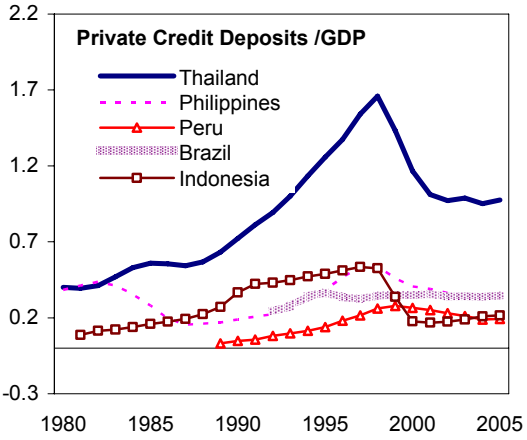
The banking sector dominates.



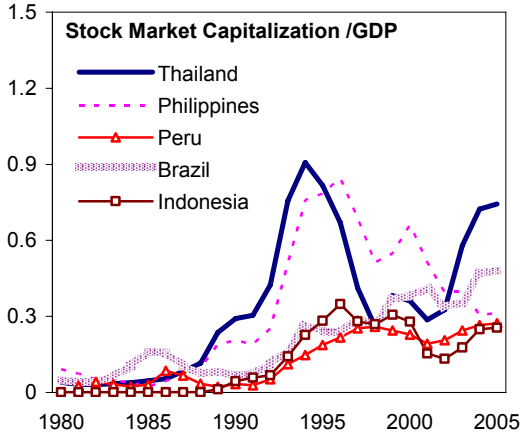
Financial intermediation is high.



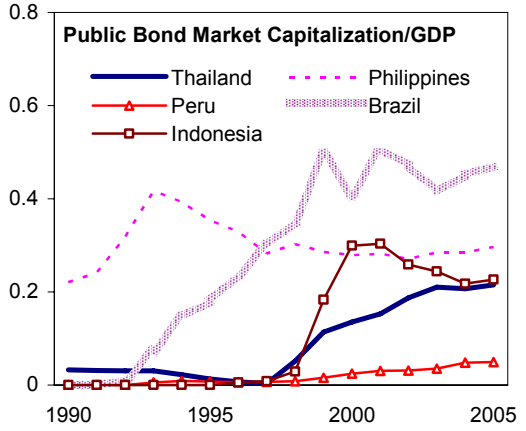
Credit to GDP is also high.



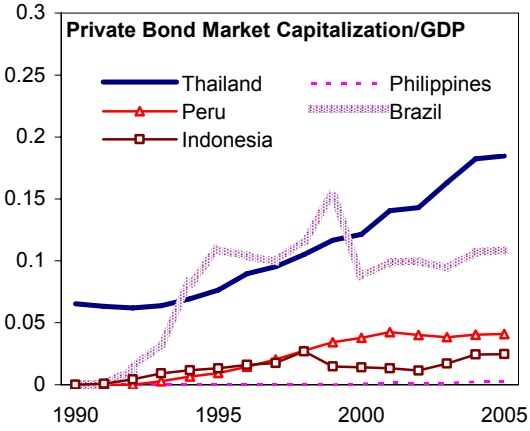
The equity market is important.



Bond Markets are…



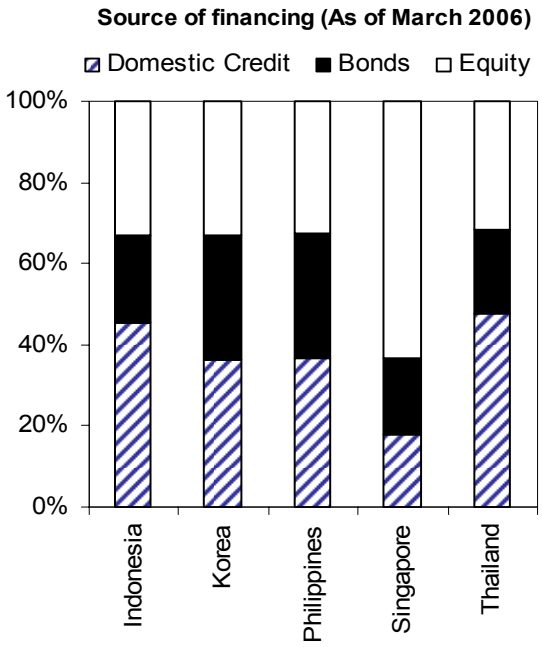
...expanding.



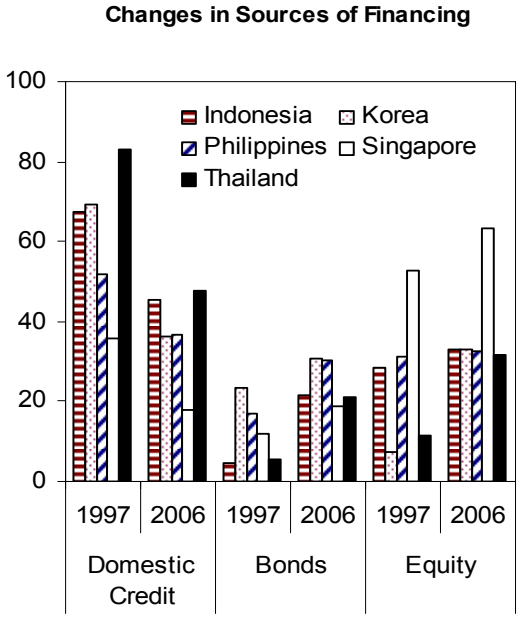
Source: World Bank.

Figure 2. Thailand: Financing in Selected Asian Countries

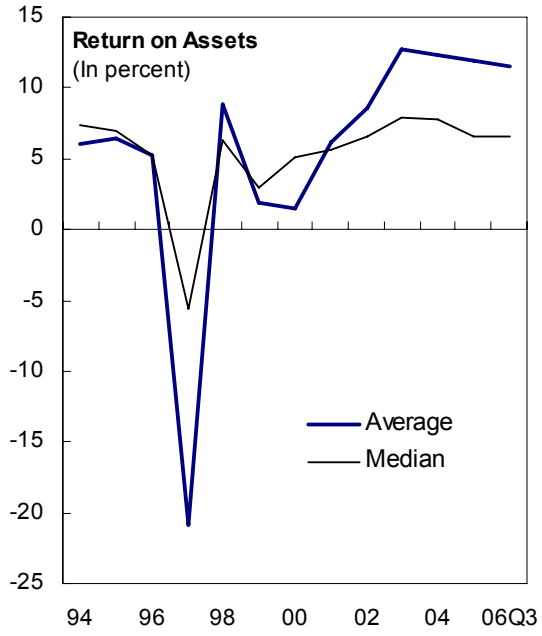
Domestic credit is important...



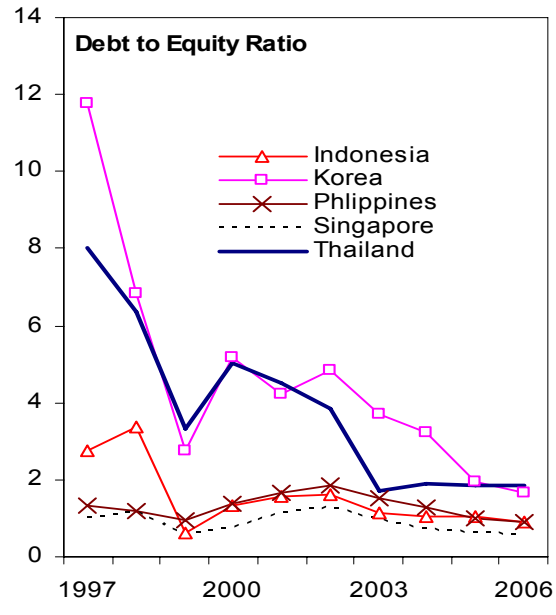
…but declining.



Corporate sector retained earnings have increased...



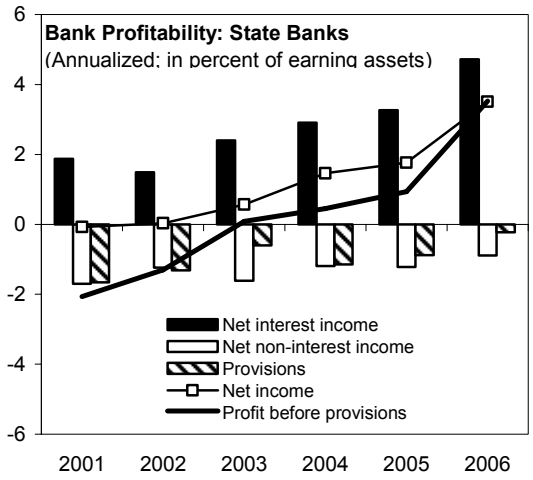
...and debt to equity declined.



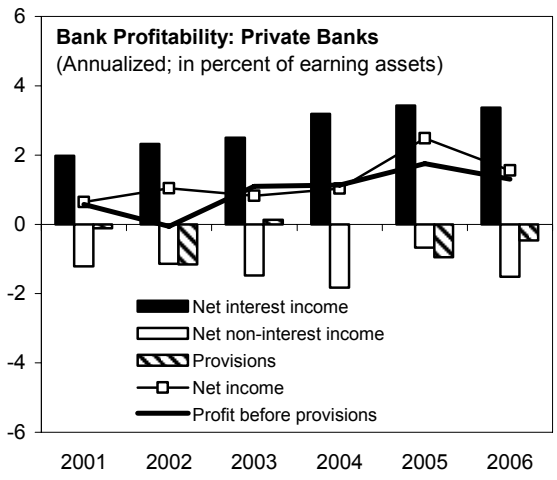
Sources: World Bank; Asian Bondsonline—*Asia Bond Indicators.*
Note: 2006 data indicates March 2006 data, otherwise indicated.

Figure 3. Thailand: Development in Banking Indicators

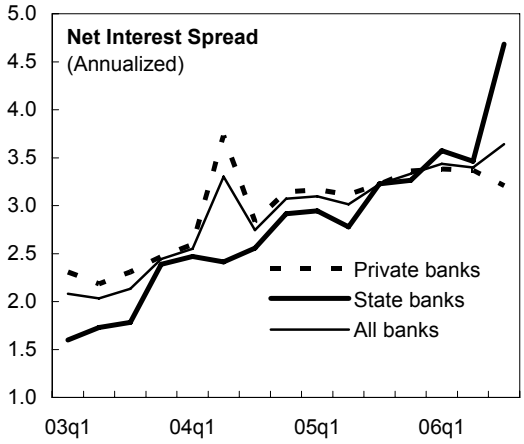
Bank remained...



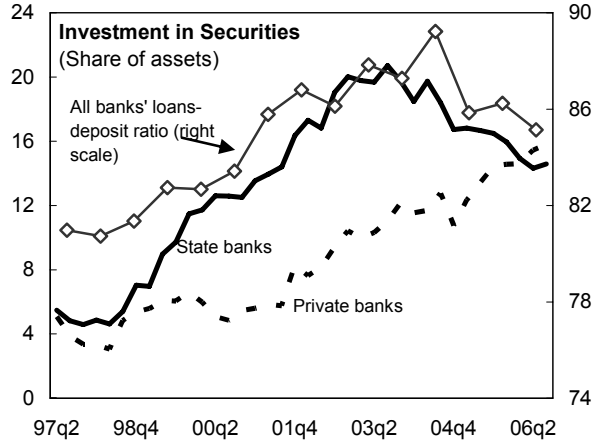
…profitable.



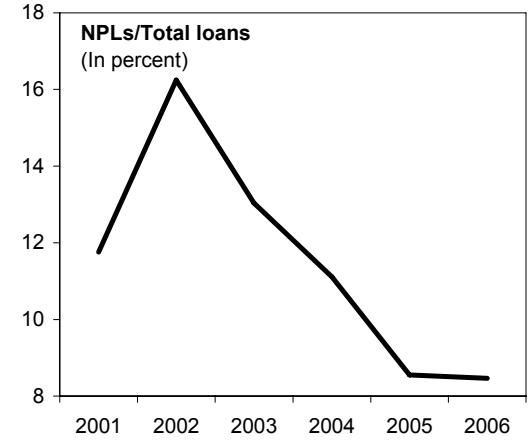
With net interest spreads rising.



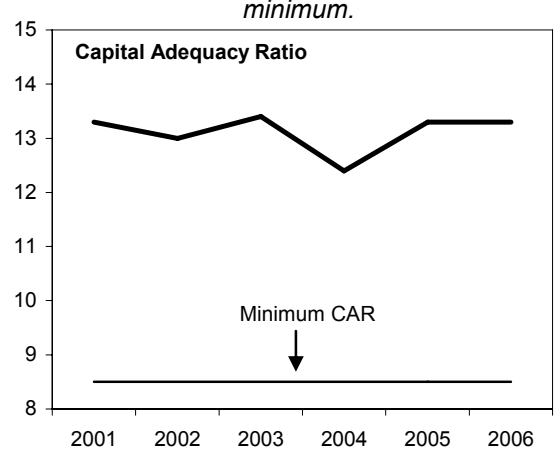
Investment in securities have declined.



Although asset quality remains high.



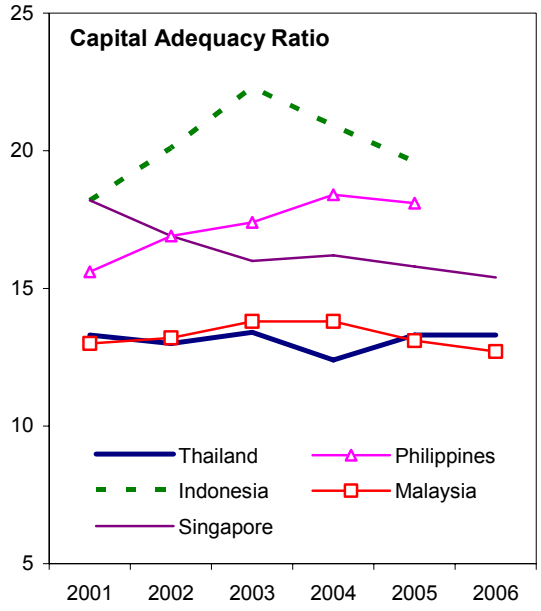
The capital adequacy ratio is above the minimum.



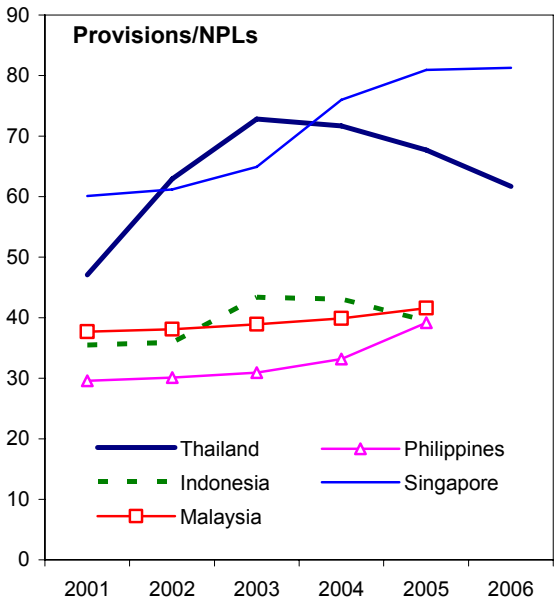
Source: Bloomberg.

Figure 4. Thailand's Banking Sector vs. Other ASEAN Countries

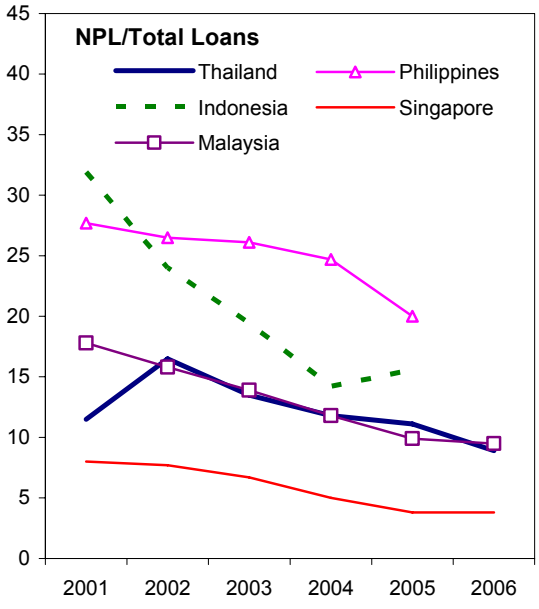
CAR is among the lowest.



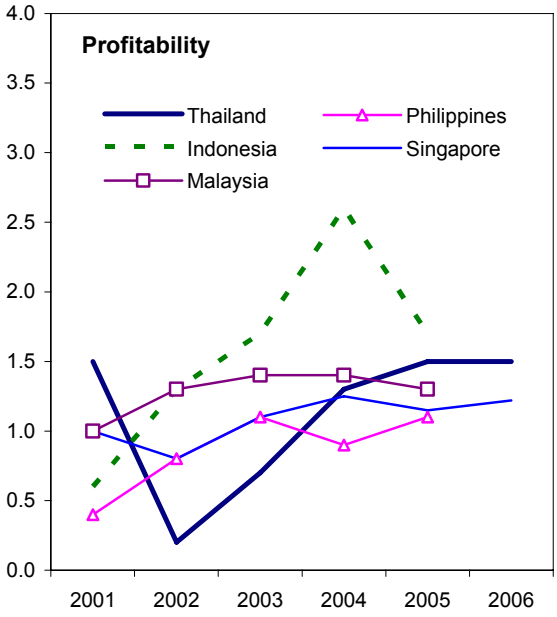
Provisioning levels have declined.



NPLs have also declined.

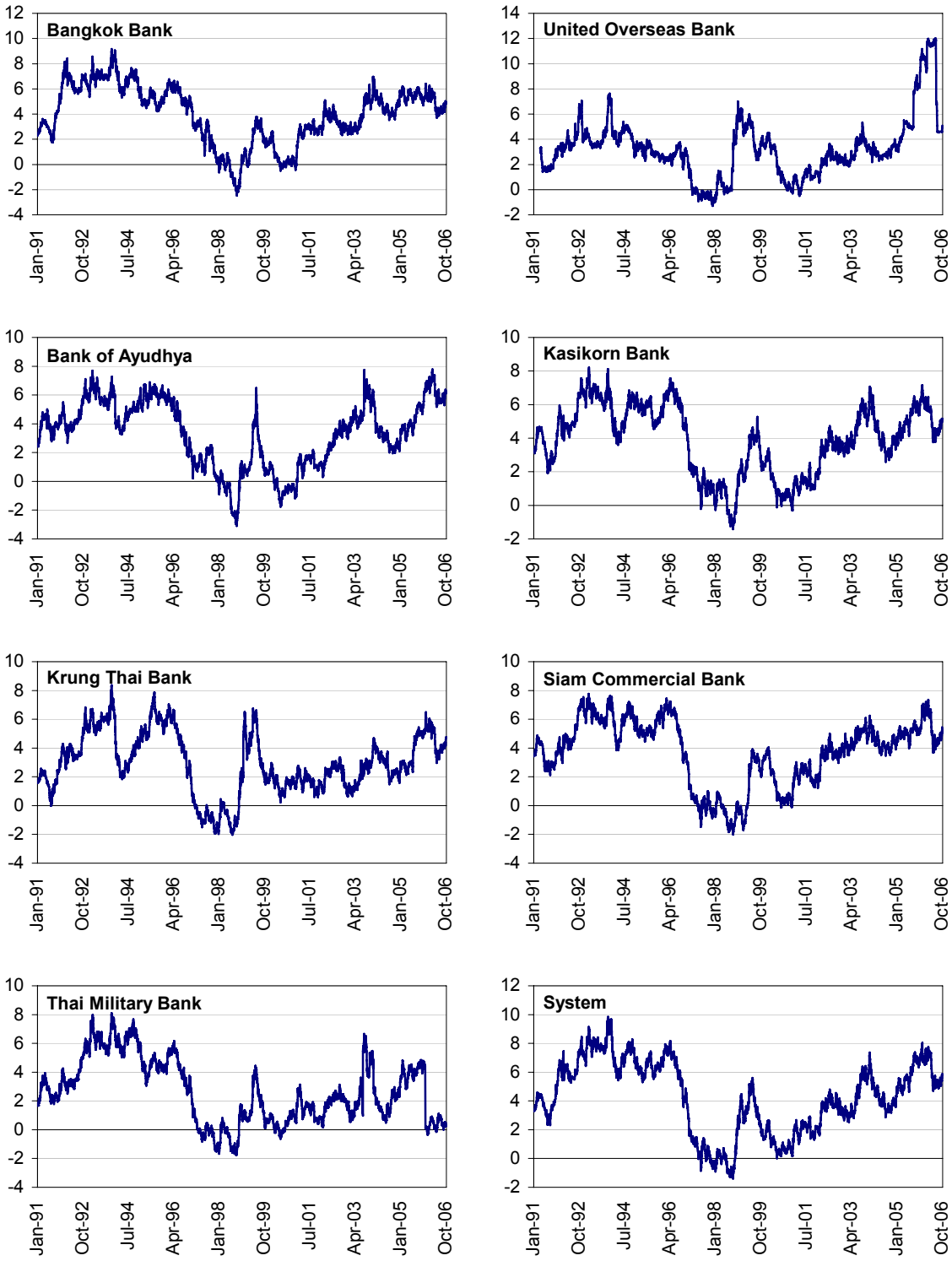


But profitability has improved.



Source: *Global Financial Stability Report*.

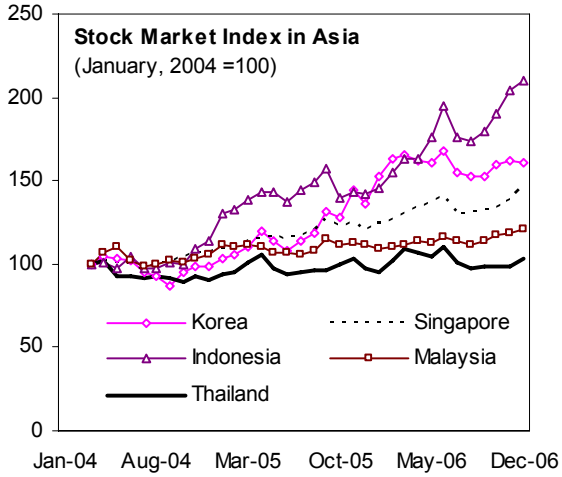
Figure 5. Thailand: Distance to Default in Thailand's Banks



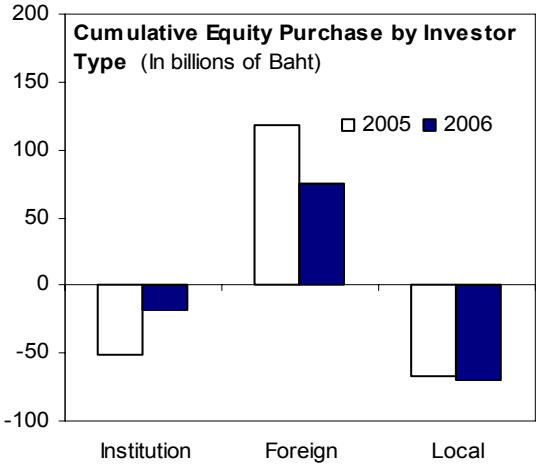
Source: Bloomberg.

Figure 6. Thailand: Financial Market Indicators

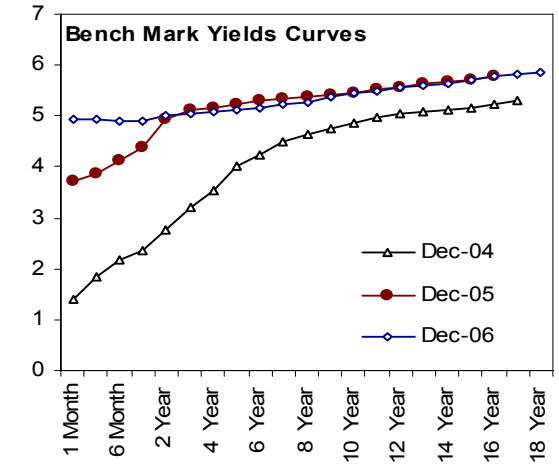
The equity market lags others in Asia.



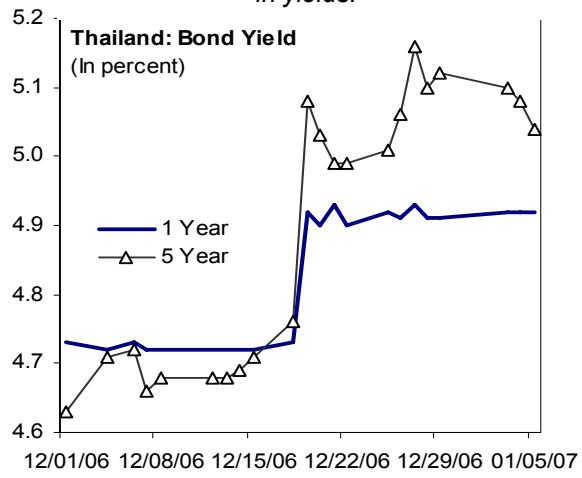
Foreigners were net buyers until recently.



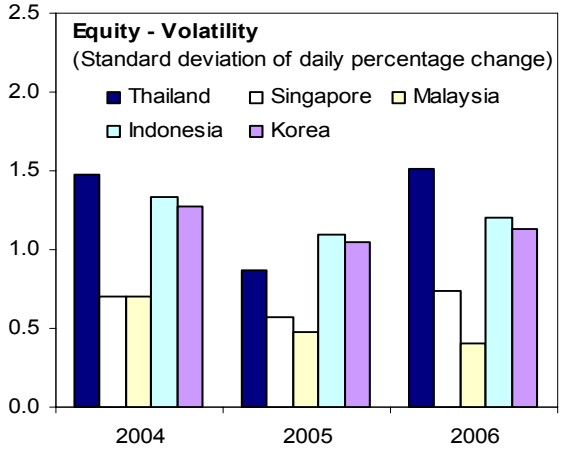
The yield curve has flattened...



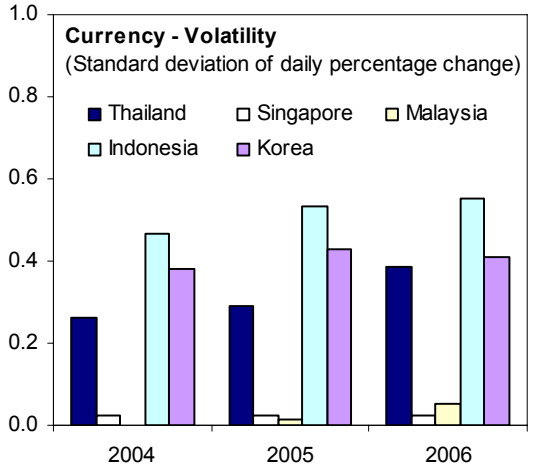
...although capital controls led to a spike in yields.



Votality has increased...



...reflecting recent events.



Sources: Bank of Thailand and Bloomberg.