Financial Integration in East Asia

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This paper examines the degree of integration into world financial markets and the impacts on several key macroeconomic variables of selected East Asian economies, and draws policy implications. According to our analysis, the degrees of integration into world financial markets in those economies are increasing. Regarding the impacts of increasing integration into world financial markets on several macroeconomic variables, we find three results. First, casual two-way plots among macroeconomic variables do not support the theoretical prediction of reduction in relative consumption volatility. Second, the saving-investment correlation is higher than those of the euro area economies. Third, the degrees of smoothing of idiosyncratic shock by cross-holding of financial assets are lower than in the euro area economies. These results suggest two policy implications. First, there is some room for improvement in welfare gains in those economies by means of further risk sharing. Second, holding all other conditions equal, the increasing integration into world financial markets alone is unlikely to provide sound grounds for a currency union in East Asia at this stage.

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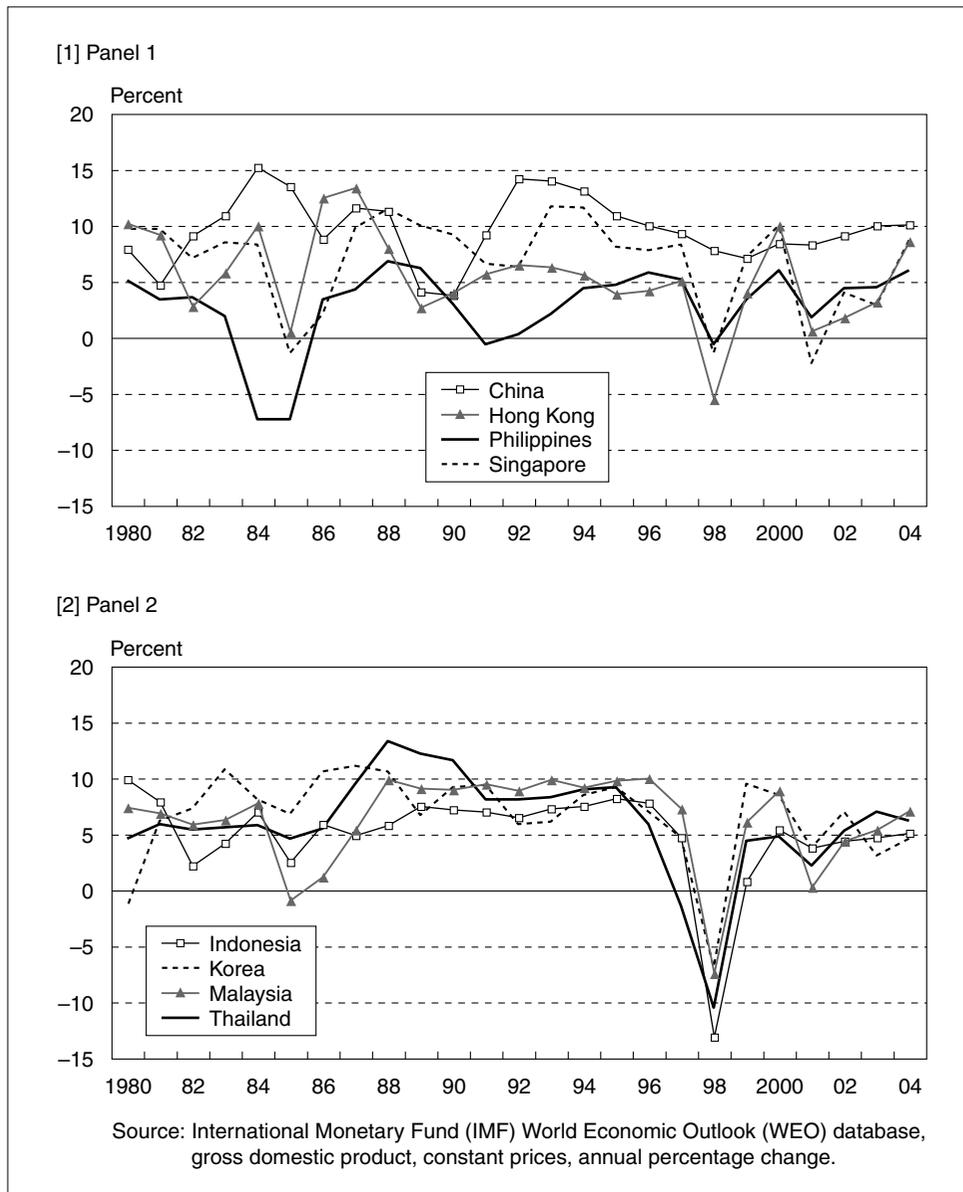
I. Introduction

The wave of financial liberalization since the mid-1980s facilitated massive capital inflows to the Asian economies. The capital inflows helped those economies to take off, but at the same time were blamed for the subsequent Asian currency and banking crisis.

Since the crisis, Asian economies have recorded remarkable economic growth driven mainly by the region's growth engine, the People's Republic of China (hereafter, China) (Figure 1), and regional trade integration seems to have increased. As distinct

Figure 1 Real GDP Growth Rate

[1] Panel 1

[2] Panel 2

Source: International Monetary Fund (IMF) World Economic Outlook (WEO) database, gross domestic product, constant prices, annual percentage change.
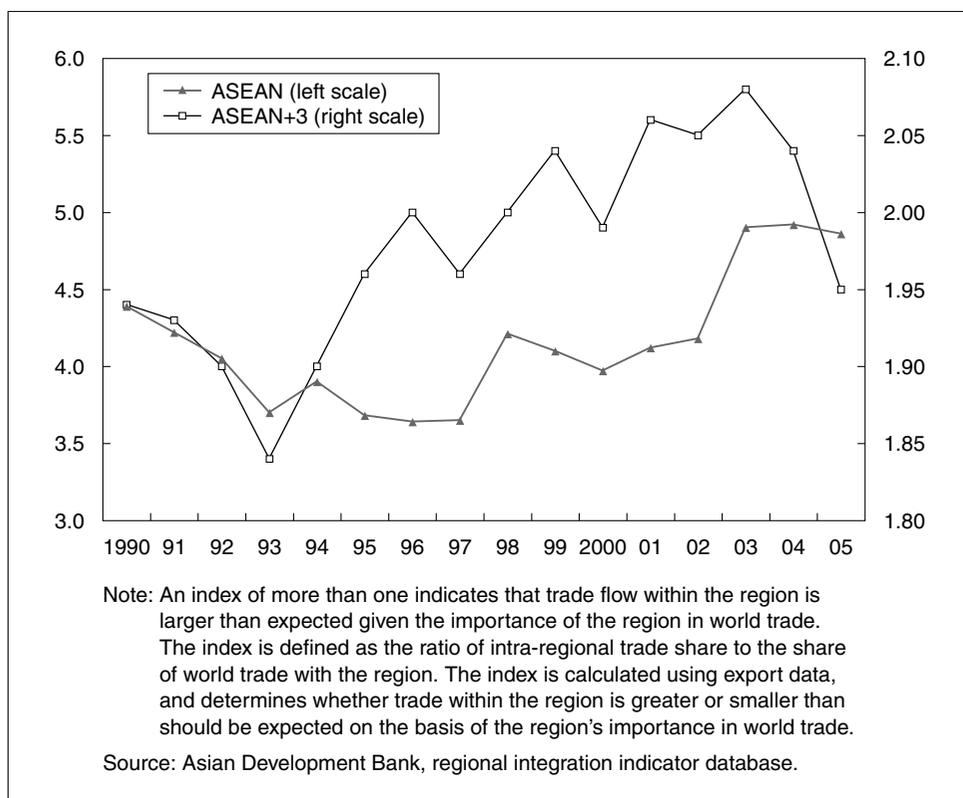
from the pre-crisis period, not only the larger economies but also the smaller ones have recorded fast growth with the expansion of the so-called vertical chain of production. This expansion is contributing to the rising intra-regional trade intensity index in the ASEAN and ASEAN+3 economies, despite the adverse effects of the East Asian financial crisis (Figure 2).

The export-led growth in those economies supported by the capital inflows led to massive accumulation of gross foreign assets, especially in the form of foreign reserves, and the accumulation of gross foreign liabilities, especially in the form of foreign direct investment (FDI), as documented by Lane and Milesi-Ferretti (2006). The accumulation of gross foreign assets and liabilities, and the significance of valuation effects arising from exchange rate fluctuations, originally discussed in the context of "original sin," constitute the core issues of global imbalance (see Obstfeld and Rogoff [2005a, b] and Lane and Milesi-Ferretti [2002, 2004]).

Motivated by regional trade integration and the global imbalance in world financial markets, we ask the following questions in this paper. First, have the degrees of integration into world financial markets in the Asian economies increased or not after the Asian currency and banking crisis? Have the Asian economies benefited from the increased integration into such markets? And which exchange rate regimes should the Asian economies adopt, given the active capital inflows and outflows?

Figure 2 Intra-Regional Trade Intensity Index

Note: An index of more than one indicates that trade flow within the region is larger than expected given the importance of the region in world trade. The index is defined as the ratio of intra-regional trade share to the share of world trade with the region. The index is calculated using export data, and determines whether trade within the region is greater or smaller than should be expected on the basis of the region's importance in world trade.

Source: Asian Development Bank, regional integration indicator database.

To answer these questions, we examine the degree of integration into world financial markets and its impacts on several key macroeconomic variables, and draw policy implications, paying special attention to the emerging market economies in the Executives' Meeting of East Asia-Pacific Central Banks (EMEAP) group.[1]

In examining the impact of integration, we will employ relatively simple empirical methods in reduced forms rather than a fully specified general equilibrium model. Our approach has the advantages that it is comparable with many previous studies, and that it can be reconciled with the lack of the consensus on the general equilibrium model to analyze the issue of global imbalance.[2]

Our analysis shows the following results on the degree of integration into world financial markets and its impacts on several key macroeconomic variables. The degrees of integration into world financial markets in the EMEAP economies are increasing, according to our analysis of the database compiled by Lane and Milesi-Ferretti (2006). Regarding the impacts of increasing integration into world financial markets on several macroeconomic variables, we find three results. First, casual two-way plots among macroeconomic variables hardly support the theoretical prediction of reduction in relative consumption volatility. Second, the saving-investment correlation is higher than those of the euro area economies. Third, the degrees of smoothing of idiosyncratic shock by cross-holding of financial assets are lower than in the euro area economies.

These results suggest two policy implications. First, there is some room for improvement in welfare gains by means of further risk sharing in the EMEAP economies. Second, holding all other conditions equal, the increasing integration into world financial markets alone is unlikely to provide sound grounds for a currency union in East Asia at this stage.

The organization of this paper is as follows. Section II documents the degree of integration into world financial markets through various measures. These include the data on foreign assets and liabilities in Lane and Milesi-Ferretti (2006), a *de jure* measure by Chinn and Ito (2006; data until 2003), and data on Coordinated Portfolio Investment Survey by the International Monetary Fund (IMF). Section III presents a series of tests to illustrate the effects of integration into world financial markets. We begin by examining several hypotheses where integration into world financial markets has some effects on key macroeconomic variables such as economic growth and consumption volatilities. We then test the saving-investment nexus as claimed by Feldstein-Horioka (1980) to see whether the degree of international capital mobility has increased, especially after the Asian financial crisis. Further, we

test a risk-sharing hypothesis as in Asdrubali, Sørensen, and Yosha (1996) (hereafter, ASY [1996]) in the international context and Ravallion and Chaudhuri (1997) to see whether consumption growth smoothing is taking place as integration into world financial markets has been progressing in Asia. In Section IV, we discuss policy implications, particularly on exchange rate regimes in the EMEAP economies. The final section concludes the paper.

II. Integration into World Financial Markets in East Asia

This section examines trends of integration into world financial markets in the EMEAP economies by looking at several measures. Particular attention is paid to the "EMEAP8" economies excluding the three high per capita income economies, Australia, New Zealand, and Japan. We compare their trends of international integration into world financial markets with those in the euro area economies and other advanced economies. In the following analysis, we refer to the euro area economies excluding Luxembourg and Slovenia as the Euro11.[3] Our broadest sample of economies consists of the EMEAP economies, Euro11, Canada, Switzerland, the United Kingdom, and the United States (see Table 1 for the availability of the data series).

A. External Assets and Liabilities to GDP

Lane and Milesi-Ferretti (2006) propose two ways of measuring the degree of *de facto* integration into world financial markets.[4] The first measure is the ratio of the sum of external assets and liabilities to GDP (*IFIGDP*). The second measure, *GDOGDP*, focuses on portfolio equity and direct investment:

$$GDOGDP = (PEQA + FDIA + PEQL + FDIL)/GDP,$$

where *PEQA* (*PEQL*) denotes the stock of portfolio equity assets (liabilities) and *FDIA* (*FDIL*) denotes the stock of direct investment assets (liabilities).

Figure 3 shows the first measure of integration into world financial markets, *IFIGDP* over the period from 1970 to 2004. Consistent with Lane and Milesi-Ferretti (2006), *IFIGDP* accelerated its growth especially around the mid-1990s across all regions.

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3. Data on Luxembourg are available only after 2000, and thus excluded from the following analysis.
4. Lane and Milesi-Ferretti (2006) construct a consistent series of external assets and liabilities, as well as capital inflows and outflows on the basis of residence principle for 145 economies over the period 1970–2004. The data are classified in the following five broad categories: (1) portfolio investment (ownership of shares of companies and mutual funds below 10 percent) subdivided into equity securities and debt securities (including bonds and money market instruments); (2) foreign direct investment (equity participations above 10 percent); (3) other investment (which includes debt instruments such as loans, deposits, and trade credits); (4) financial derivatives (the value of the outstanding derivative's contract); and (5) reserve assets (foreign exchange, holdings of Special Drawing Rights, and reserve position in the IMF).

Table 1 Country Group and Data Availability

	Group				Data sample starting year (blank denotes 1970 unless indicated otherwise)								
	EMEAP	EMEAP8	Euro11	All	Portfolio equity assets	Portfolio equity liabilities	FDI assets	FDI liabilities	Debt assets (portfolio debt plus other investment)	Debt liabilities (portfolio debt plus other investment)	Financial derivatives (assets)	Financial derivatives (liabilities)	Total reserves minus gold
China	Yes	Yes		Yes	1980	1980	1981	1981	1981	1981	n.a.	n.a.	1977
Hong Kong	Yes	Yes		Yes	1979	1979	1979	1979	1979	1979	2000	2000	
Indonesia	Yes	Yes		Yes			1979				2002	2002	
Korea	Yes	Yes		Yes							2001	2001	
Malaysia	Yes	Yes		Yes							2001	2001	
Philippines	Yes	Yes		Yes	1980		1980				2001	2001	
Singapore	Yes	Yes		Yes							2001	2001	
Thailand	Yes	Yes		Yes							2000	2000	
Australia	Yes			Yes					1986	1986			
New Zealand	Yes			Yes					2000	2000			
Japan	Yes			Yes					1995	1995			
Austria			Yes	Yes							1994	1994	
Belgium			Yes	Yes							1995	1995	
Finland			Yes	Yes							1993	1993	
France			Yes	Yes							1994	1994	
Germany			Yes	Yes							n.a.	n.a.	
Greece			Yes	Yes		1986					2000	2000	
Ireland			Yes	Yes							2001	2001	
Italy			Yes	Yes							2000	2000	
Netherlands			Yes	Yes							1999	1999	
Portugal			Yes	Yes					1972	1972	1996	1996	
Spain			Yes	Yes							n.a.	n.a.	
Canada				Yes							n.a.	n.a.	
Switzerland				Yes							n.a.	n.a.	
United Kingdom				Yes							n.a.	n.a.	
United States				Yes							n.a.	n.a.	

Note: n.a. = not available.

Does the increase of integration into world financial markets observed in the data on aggregate EMEAP economies apply to individual EMEAP economies? To see this point, Table 2 shows the sample average of *IFIGDP* for each EMEAP economy for the period from 1980–84, 1985–89, 1990–94, and 1995–99, and 2000–04. The Hong Kong Special Administrative Region of China (hereafter, Hong Kong) and Singapore have remarkably high ratios; however, they do not alter the overall trend indicating that *IFIGDP* increased irrespective of an economy's initial degree of integration into world financial markets.

Figure 3 Integration into World Financial Markets

Note: The ratio of the sum of external assets and liabilities to GDP.
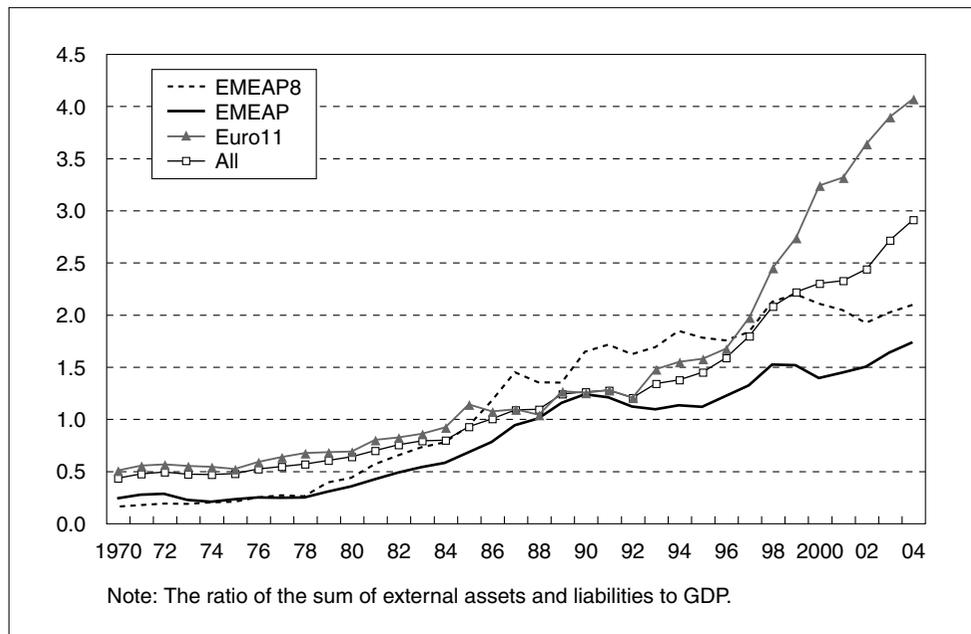
Table 2 Ratio of the Sum of External Assets and Liabilities to GDP

Period of the data	1980−84	1985−89	1990−94	1995−99	2000−04
China	0.134	0.230	0.448	0.707	0.932
Hong Kong	5.035	11.233	13.535	11.883	12.276
Indonesia	0.407	0.716	0.836	1.297	1.177
Korea	0.663	0.532	0.393	0.737	0.947
Malaysia	1.045	1.397	1.493	1.780	2.035
Philippines	0.858	1.070	1.045	1.192	1.418
Singapore	2.266	3.473	3.634	6.050	9.266
Thailand	0.455	0.626	0.865	1.042	1.334
Australia	0.452	0.861	1.112	1.453	2.036
New Zealand	0.642	1.218	1.514	1.823	2.223
Japan	0.386	0.790	0.964	1.042	1.184
EMEAP8	0.624	1.243	1.695	1.930	2.030
EMEAP	0.469	0.905	1.151	1.333	1.535

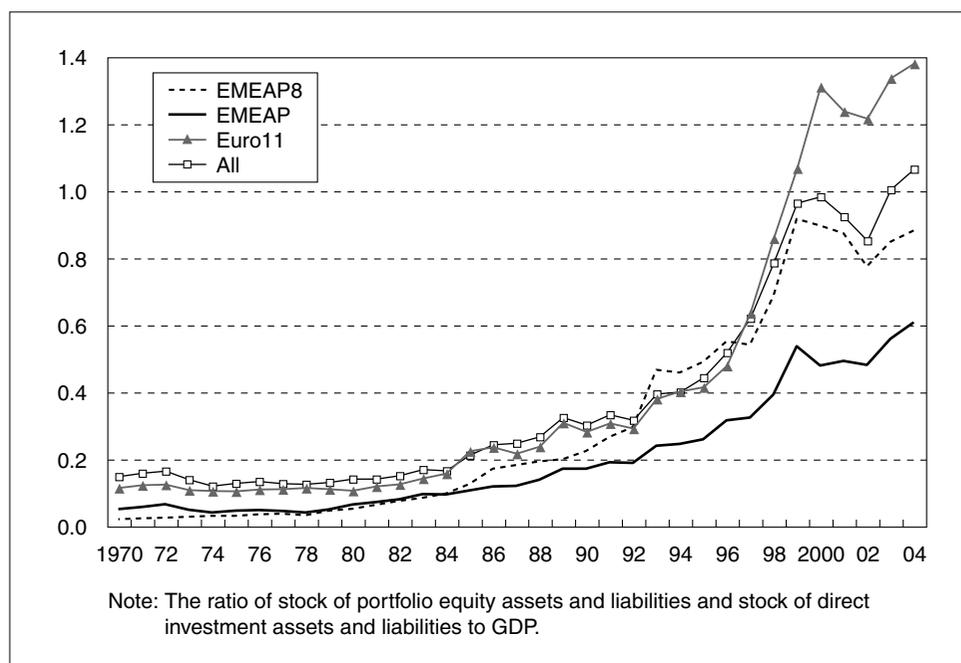Note: (*IFIGDP*): Five-year sample average.

Figure 4 shows the second measure: *GDOGDP* over the period from 1970–2004. The second ratio aims at checking whether the general increase in the degree of integration into world financial markets applies to the subgroup of portfolio equity and FDI holdings, because the trend observed in the first measure might be driven by special factors in international trade in debt instruments.

The ratio had been stable until 1978, but started to rise in 1985 followed by a sharp acceleration beginning in 1996, except for 2001–02, replicating the finding in Lane and Milesi-Ferretti (2006) for the industrialized countries, developing countries, and emerging countries. Again, Hong Kong and Singapore have remarkably high ratios, but they do not alter the overall trend.

B. *De Jure* Measure

We see another measure of capital account openness based on the information on controls on financial flows to and from each economy, namely a *de jure* index, because the *de facto* (e.g., *IFIGDP* or *GDOGDP*) and *de jure* measures can deviate from each other for several reasons. Indices measuring *de jure* integration into world financial markets, such as those by Chinn and Ito (2006; data until 2003)[5] and Kose *et al.* (2006, data until 2004), are usually constructed using the disaggregated capital and

Figure 4 International Equity Integration

Note: The ratio of stock of portfolio equity assets and liabilities and stock of direct investment assets and liabilities to GDP.

5. Their index is the first principal component of the four IMF binary variables on multiple exchange rates, capital account, current account, and requirements to surrender export proceeds. For the extension of the four binary classifications after 1996, they follow Mody and Murshid (2005).
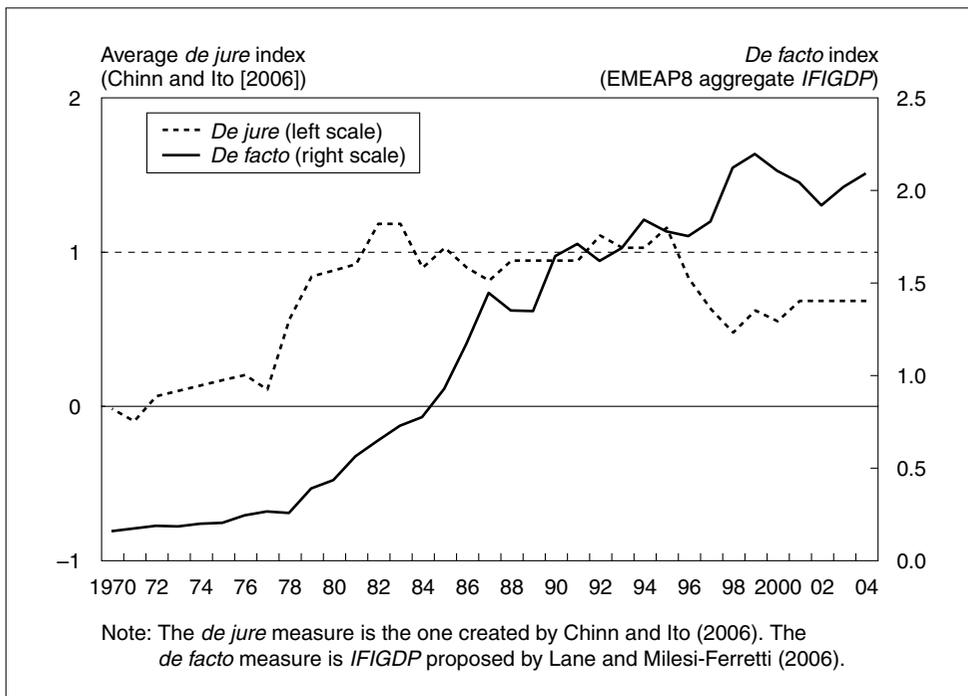
current account restrictions found in *Annual Report on Exchange Arrangements and Exchange Restrictions* (AREAER), published by the IMF.[6]

Figure 5 shows two measures. As opposed to the persistent upward trend in the *de facto* measure, there appeared a reversal in the progress of the current and capital account openness in the mid-1990s. According to Chinn and Ito (2006), the reversal in the *de jure* measure is due to Indonesia and Malaysia. This might reflect the introduction of a monitoring system for capital flows in Indonesia and a reimposition of controls on capital flows in Malaysia. Nonetheless, the capital accounts have generally been kept open, and the *de facto* measure has continued to rise.

C. Bilateral Financial Flows

While both *IFIGDP* and *GDOGDP* exhibit clear upward trends, one could claim that this is due to increasing intra-regional integration and not to world financial markets. As data on bilateral financial flows are still limited, it is hard to determine this claim. Nonetheless, the data series in the Coordinated Portfolio Investment Survey that the IMF compiles provides some insights on this issue. The survey reports bilateral flows in equity and debt securities for the years 1997 and 2001–05. The data are available for all the EMEAP8 economies except China.

Figure 5 *De Jure* Versus *De Facto* Integration into World Financial Markets

Note: The *de jure* measure is the one created by Chinn and Ito (2006). The *de facto* measure is *IFIGDP* proposed by Lane and Milesi-Ferretti (2006).

6. Kose *et al.* (2006) use two financial openness variables. One variable is the financial openness variable as defined by Chinn and Ito (2006). The other variable is a binary indicator created by the authors based on data from the AREAER line E2, which signifies "restrictions on payments for capital transactions."

Table 3 reports, for the seven EMEAP8 economies, the average outward investment going to the EMEAP8 (minus the own-country) economies and to the G-7 countries as a percentage of total outward investment. On average, the EMEAP8 economies invested about 16 percent of the total within the region, while almost half of the total investment went to the G-7 countries. Within the investment flowing into the G-7 economies, the United States was the major recipient. Although the short sample period does not allow us to generalize as to trends, at the very least it is clear that despite the geographical proximity and the increasingly tightened trade link, the industrialized countries remain the major investment destinations for the EMEAP8 economies rather than the latter's neighbors.

D. Capital Structure

Given the increasing trend in the degree of integration into world financial markets, Lane and Milesi-Ferretti (2006) also show that a measure of capital structure, the ratio of equity (portfolio plus FDI) liabilities to total financial liabilities, has been also rising globally. Figure 6 shows that the ratio for the EMEAP8 economies was quite stable until it started to increase in the 1990s. In the other regions, EMEAP, the Euro11, and all the sample economies, the ratio declined during the 1970s, but turned to an increasing trend in the 1980s followed by a rapid increase in the 1990s, consistent with the analysis by Lane and Milesi-Ferretti (2006). The trends in individual economies shown in Figure 7 are similar to the trend in the EMEAP8 aggregate, although the ratio for China did not drop even in 1997–98. Regarding the composition of equity share, most of the increase in external liabilities in China was explained by the FDI liabilities, rather than the portfolio equity liabilities. The increase in FDI liabilities has been common in the EMEAP economies except for Indonesia and Korea, where the growth in FDI liabilities has been slow.

Table 3 Securities Issued by Nonresidents and Owned by Residents: Outward Investment

Percent of total value of investment, five-year sample average, 2001–05

From \ To	EMEAP8	G-7
Hong Kong	13	41
Indonesia	16	40
Korea	9	60
Malaysia	31	36
Philippines	6	49
Singapore	22	49
Thailand	15	63
Average	16	48

Figure 6 Equity Share in External Liabilities

Note: Share of equity (portfolio plus FDI) liabilities in total financial liabilities.
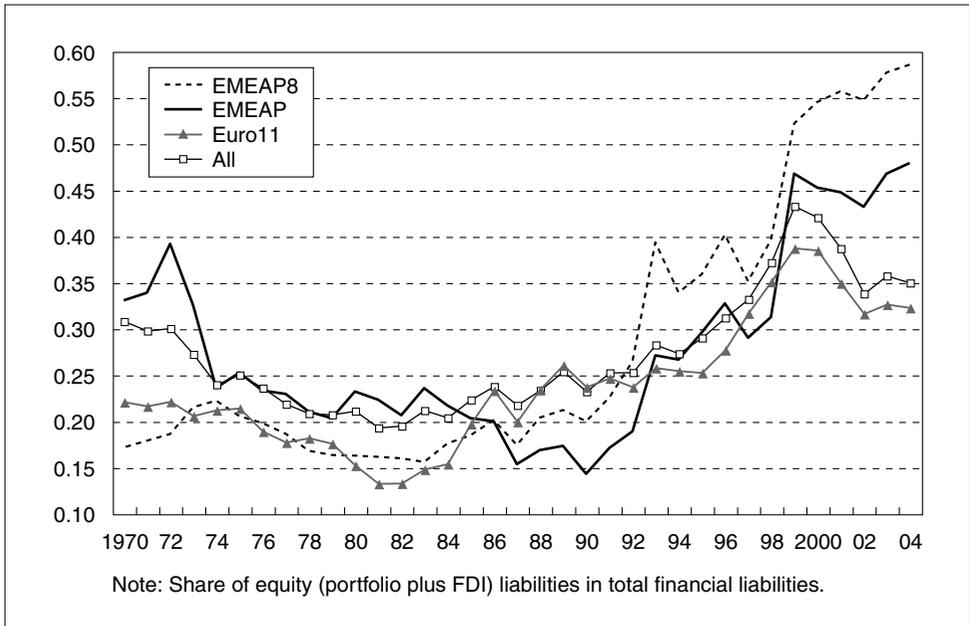
Figure 7 Equity Share in External Liabilities in the EMEAP8 Economies

Note: Share of equity (portfolio plus FDI) liabilities in total financial liabilities.
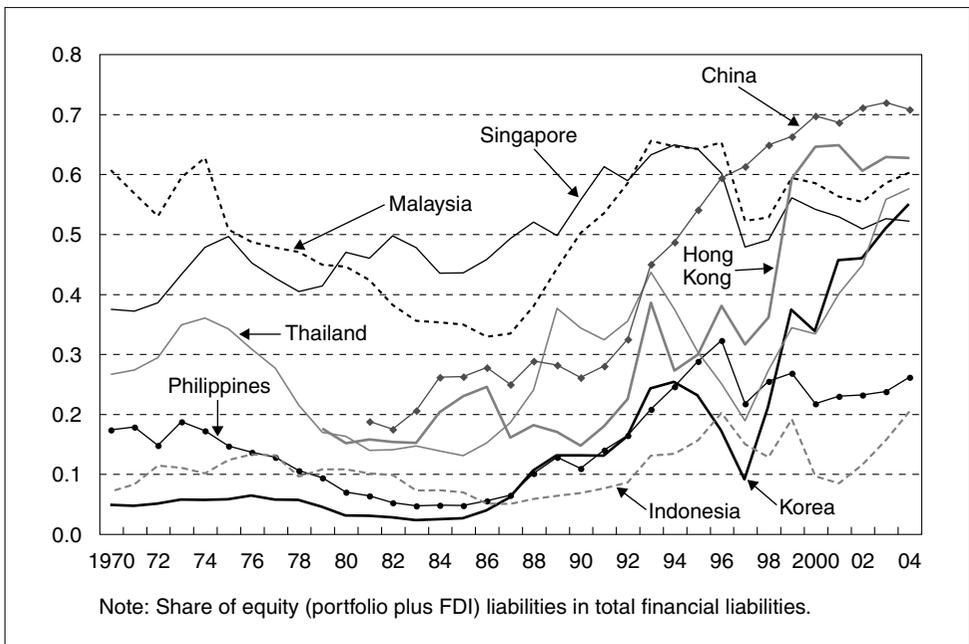
Behind the increase in equity share in total financial liabilities, we find a downward trend in debt liabilities, particularly in the 2000s (Figures 8 and 9).[7] However, Figure 10 shows that not all the EMEAP economies follow the downward trend in

Figure 8 Gross External Debt and Official Reserves to GDP
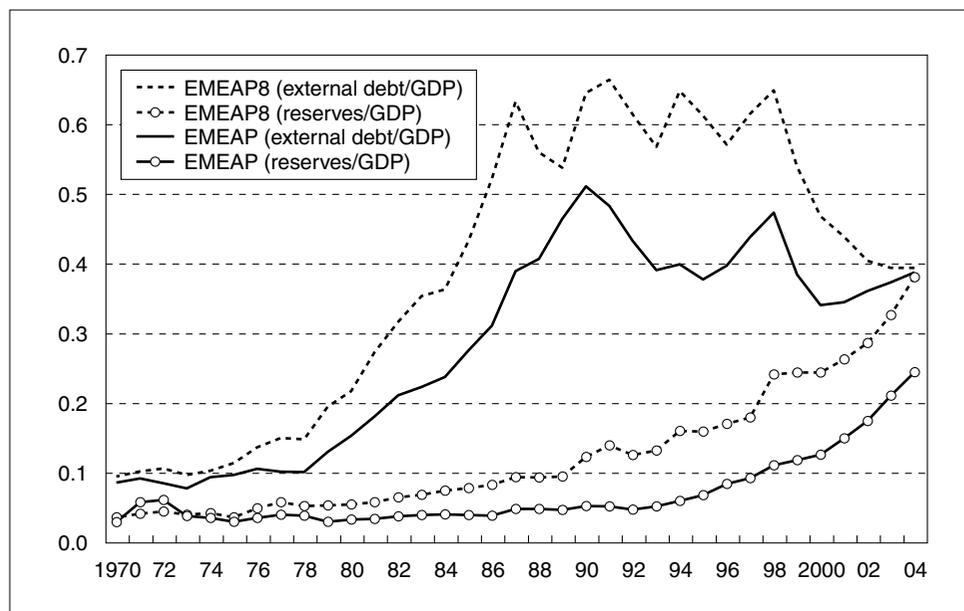
Figure 9 Gross External Debt and Official Reserves to Exports of Goods and Services
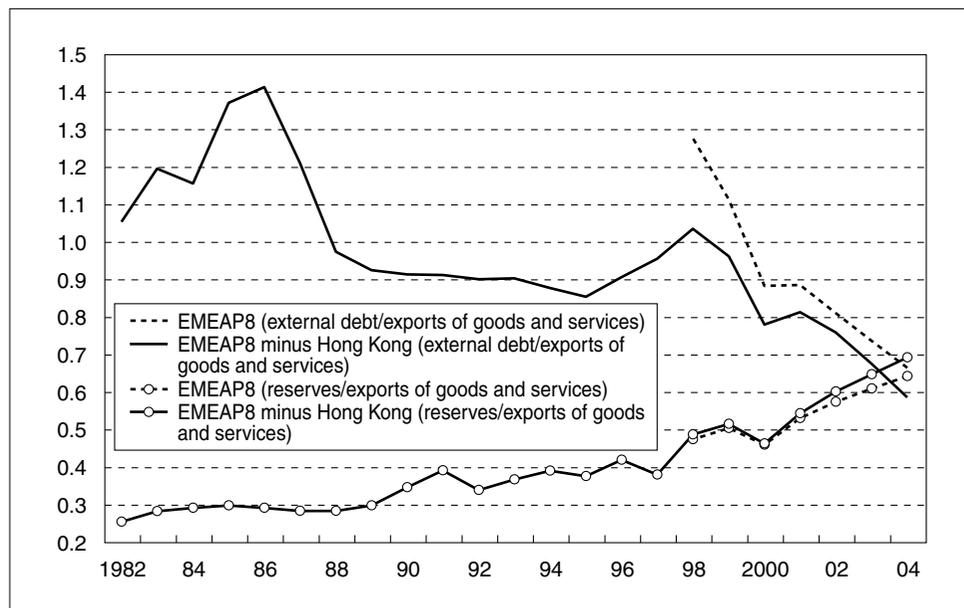
7. Limitations of the data reported in the International Financial Statistics force us to take the sample periods from 1982 to 2004 for the EMEAP8 economies minus Hong Kong, and 1998 to 2004 for the EMEAP8 economies in Figure 9.

debt liabilities as in Figure 8. The ratio for Hong Kong generally increased until 1990 and decreased steadily thereafter. The ratio for Singapore increased steadily even from the mid-1990s. For China, the ratio has been almost constant since 1990. The ratio for the crisis-hit economies, Indonesia, Korea, Malaysia and Thailand, shows a trend similar to that observed in Figure 8, while a spike is recorded in Thailand in 1998.

A notable change in the composition of gross foreign assets is the rapid increase in official reserves in the Asian economies, as can be seen in Figure 8. We view the rapid increase as a region-wide phenomenon in the EMEAP8 economies. Table 4 shows the sample average of the ratio of reserves to GDP for each EMEAP8 economy for the period from 1980–84, 1985–89, 1990–94, 1995–99, and 2000–04. Hong Kong and Singapore have relatively high ratios, but they do not alter the overall trend.

Figure 10 Gross External Debt to GDP in the EMEAP8 Economies
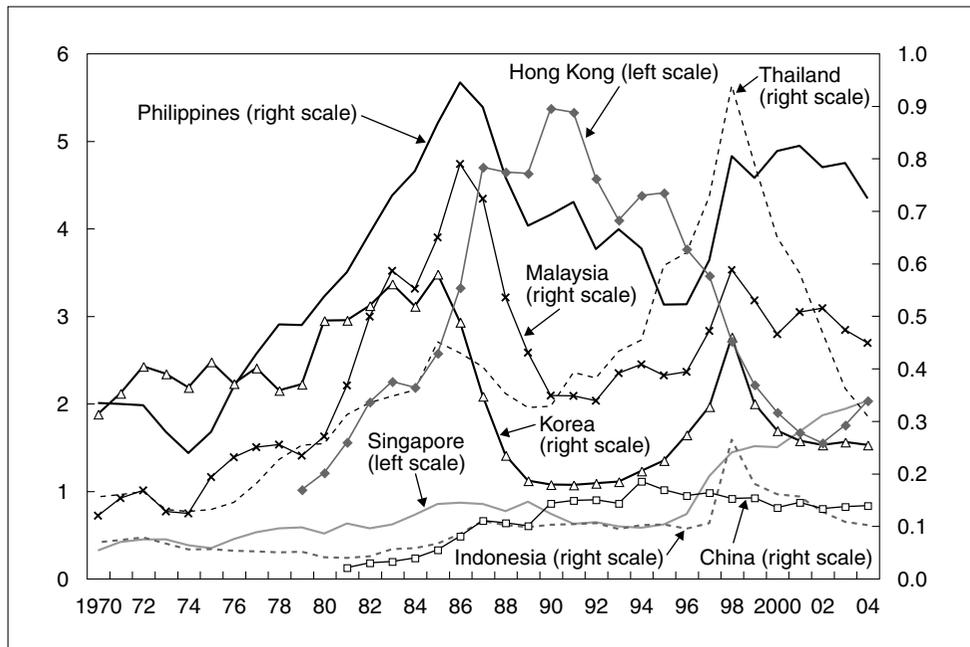
Table 4 Ratio of Reserves to GDP

Sample average from 1981–90, 1991–2000, 2001–04

	1980–84	1985–89	1990–94	1995–99	2000–04
China	0.035	0.043	0.072	0.143	0.246
Hong Kong	0.196	0.275	0.347	0.495	0.706
Indonesia	0.048	0.057	0.070	0.130	0.176
Korea	0.034	0.043	0.053	0.096	0.234
Malaysia	0.144	0.201	0.297	0.297	0.405
Philippines	0.042	0.033	0.071	0.120	0.171
Singapore	0.544	0.704	0.800	0.849	0.952
Thailand	0.045	0.086	0.186	0.226	0.285
EMEAP8	0.063	0.087	0.135	0.197	0.299

Regarding the net foreign asset position, it is well known that the U.S. net external position has deteriorated while that of emerging economies has been improving (Lane and Milesi-Ferretti [2006, figure 7]). Figure 11 shows that the recovery of the net foreign asset position applies to the EMEAP economies. Hong Kong, Japan, and Singapore remained net creditors after 1995, and China became a net creditor after 2003. While improving their net asset positions, the other EMEAP8 economies are still net debtors.

E. Summary and Caveats
This section summarizes the findings, and discusses some of the caveats deserving attention in the interpretation of our findings.
### 1. Summary
In sum, EMEAP economies are more open to international financial markets, though the composition of assets and liabilities varies from economy to economy.

We summarize the analyses of external assets and liabilities as follows. First, our measure of *de facto* integration into world financial markets, *IFIGDP* (the ratio of the sum of external assets and liabilities to GDP), indicates that the integration has been progressing in the last 35 years, and this trend is especially strong after the mid-1990s. The evidence from the bilateral financial flows indicates that about half of the outward investment of the EMEAP8 economies goes to the industrialized countries, while 16 percent on average flows into the EMEAP8 economies.

Second, on the liabilities side, the share of equity (portfolio plus FDI) liabilities in total financial liabilities has been rising for some of the EMEAP economies, except for 1997–98. Third, the ratio of gross external debt to GDP varies from economy to economy. The average trend of the EMEAP economies is close to that of the crisis-hit economies, however.

Figure 11 Ratio of Net Foreign Assets to Group GDP by Country
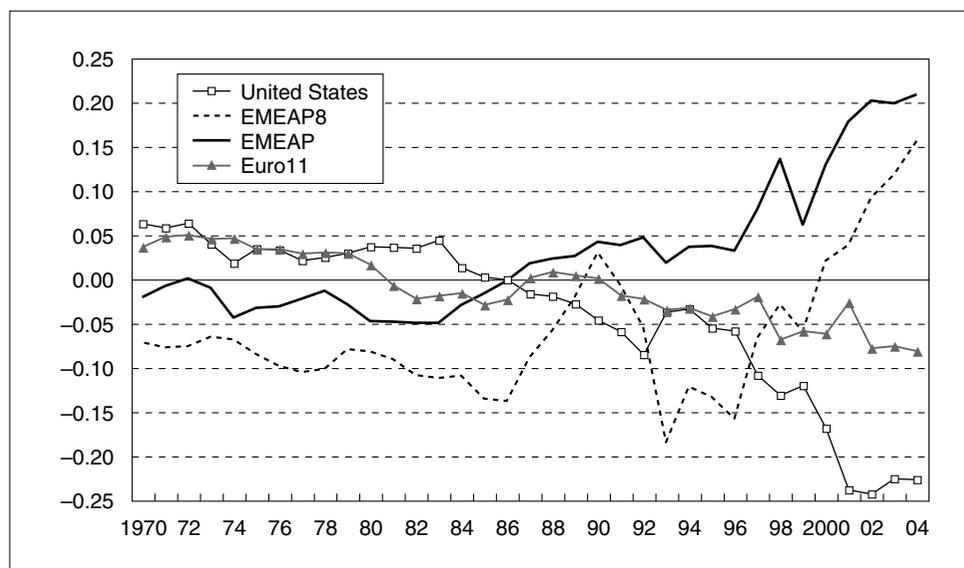
2. Caveats

We presented one widely accepted measure of the degree of financial integration using data by Lane and Milesi-Ferretti (2006). One shortcoming of the measure is that we can see a clear and increasing trend, say in Figure 3, but without a theoretical model we cannot determine the level of the *IFIGDP* measure that corresponds to the state of financial integration. One might argue that it would be better to conclude that financial integration is achieved if the expected risk-adjusted returns from the same financial assets are equalized among economies.[8] We do not look at price measures based on cross-economy differences in the expected risk-adjusted returns on the same financial assets, because domestic financial markets in some of the EMEAP economies do not seem sufficiently deep or liquid to allow efficient arbitrage of price differentials to take place (see Karolyi and Stulz [2003] for a survey on this issue). Nonetheless, we acknowledge that it is important to look at both the quantity measure, as we do, as well as the price measure, since they complement each other.

Another measurement issue is the deviation between the *de facto* and *de jure* measures. As found in our analysis and in general, the two measures could deviate from each other. When the deviation occurs, the usual treatment seems to favor the *de facto* measure over the *de jure* one. Apparently, however, we should remember that both measures have loopholes; the *de facto* measure is subject to fluctuations in prices and output, while the *de jure* one is affected by the degree of enforcement of the controls.

III. Integration into World Financial Markets and Risk Sharing

A. Integration into World Financial Markets, Growth, and Consumption

Neoclassical economics predicts that integration into world financial markets would have certain effects on macroeconomic variables. First, in a one-sector Solow-type growth model, integration into world financial markets leads to flows of capital from capital-rich economies to capital-poor ones, and in the long run the steady-state output per capita and return on capital will be equalized. If the inflow of new technology accompanies the inflow of capital, such technology will help the capital-poor economies grow faster.[9] Second, the effects of integration into world financial markets on output volatility are unclear, because integration has two offsetting effects on the country-specific shocks and industry-specific shocks depending on the stage of economic development. Namely, integration into world financial markets allows capital-poor economies at an early stage of economic development, for example, specialized in agricultural production and susceptive to weather shock, to diversify their narrow production basis. In a later stage of economic development, the integration into world financial markets and trade integration could simultaneously allow economies to specialize in particular industries according to their comparative advantages and makes those economies more susceptible to industry-specific

8. Cheung, Chinn, and Fujii (2006), for example, examine the integration between China, Hong Kong, Taiwan, the United States, and Japan using this measure.
9. Past studies, however, report that the welfare gain from receiving capital inflows is minimal. See Gourinchas and Jeanne (2006), for example.
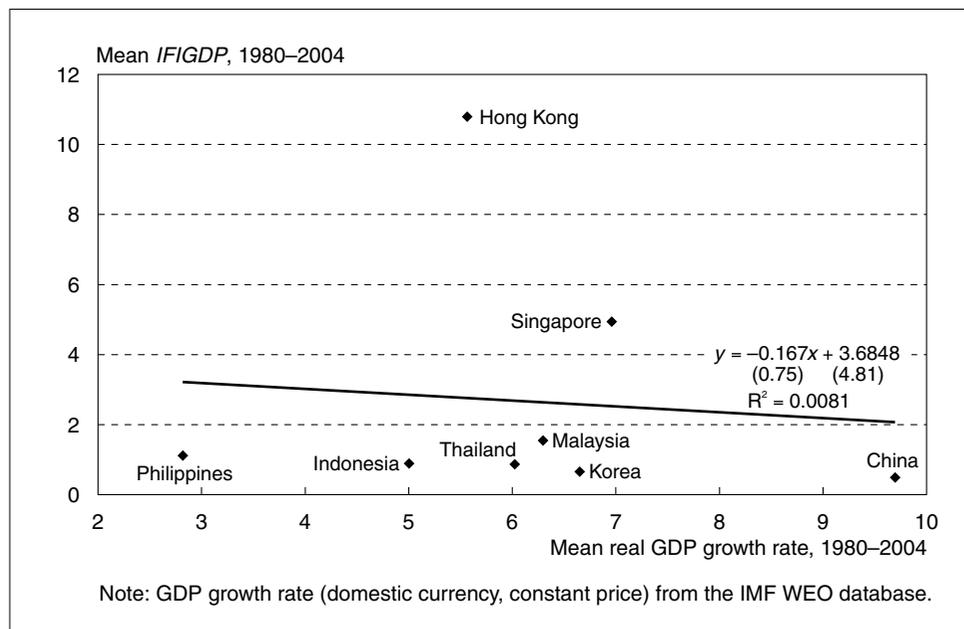
shocks. Third, integration into world financial markets should unambiguously lead to reductions in the relative volatility of consumption, because it allows risk-averse consumers in an economy to smooth the effects from idiosyncratic fluctuations in income growth on consumption growth.

Figures 12 to 15 plot our measure of integration into world financial markets, *IFIGDP*, against four macroeconomic variables of interest to us. Figure 12 plots mean *IFIGDP* against the mean growth rate of real GDP from 1980 to 2004. Among the EMEAP8 economies, we do not see a clear positive correlation between the two variables, which is consistent with what is reported in Kose *et al.* (2006) and also with the vast empirical literature, providing little robust evidence of a causal relationship between integration into world financial markets and growth. In Figures 13 to 15, the three variables, GDP volatility, consumption growth, and consumption volatility, show negative relationships at first sight, but these become unclear when excluding two very open economies, Hong Kong and Singapore. The results here might be consistent with what theory predicts for GDP volatility.[10] However, the result for consumption contradicts what the theory predicts.

B. Saving-Investment Correlation Based on Feldstein and Horioka (1980)

In this subsection, we test whether the saving-investment correlation increased or decreased before and after the Asian crisis using the methods proposed by Feldstein-Horioka (1980). The general finding in the literature is that the saving-investment

Figure 12 Integration into World Financial Markets and GDP Growth Rate

Mean *IFIGDP*, 1980–2004

$y = -0.167x + 3.6848$
(0.75)   (4.81)
$R^2 = 0.0081$

Mean real GDP growth rate, 1980–2004

Note: GDP growth rate (domestic currency, constant price) from the IMF WEO database.

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10. Figures 12 to 15 use data from 1980 to 2004 except for Hong Kong, where data start in 1981, and Thailand and Malaysia, where 2004 consumption is missing.

Figure 13 Integration into World Financial Markets and GDP Volatility

Mean *IFIGDP*, 1980–2004

$$y = -9.7303x + 6.6239$$

(9.88)   (4.22)

$R^2 = 0.1393$

◆ Hong Kong

◆ Singapore

Malaysia ◆

Philippines ◆   Indonesia ◆   ◆ Korea   China ◆

Thailand

Real GDP level volatility, 1980–2004

Note: Coefficient of variation of GDP (domestic currency, constant price) from the IMF
    WEO database.
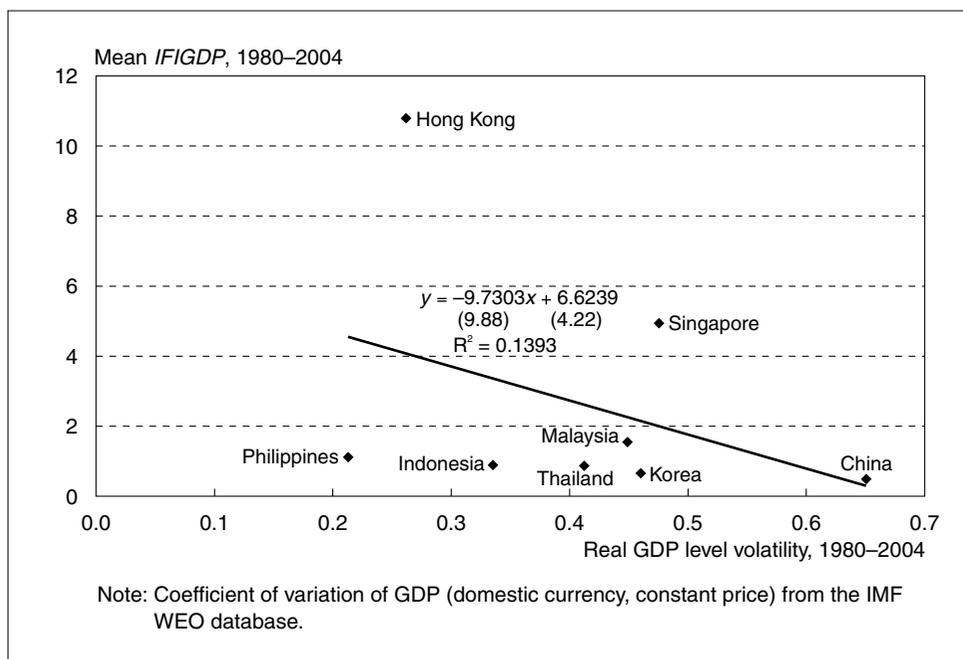
Figure 14 Integration into World Financial Markets and Consumption Growth

Mean *IFIGDP*, 1980–2004

$$y = -1.2336x + 10.689$$

(0.64)   (4.24)

$R^2 = 0.3826$

◆ Hong Kong

◆ Singapore

Malaysia

Indonesia

Philippines ◆   Thailand ◆ ◆   China ◆

Korea

Mean consumption growth, 1980–2004

Note: Household consumption growth in domestic currency deflated by CPI. Data are
    taken from the International Financial Statistics.
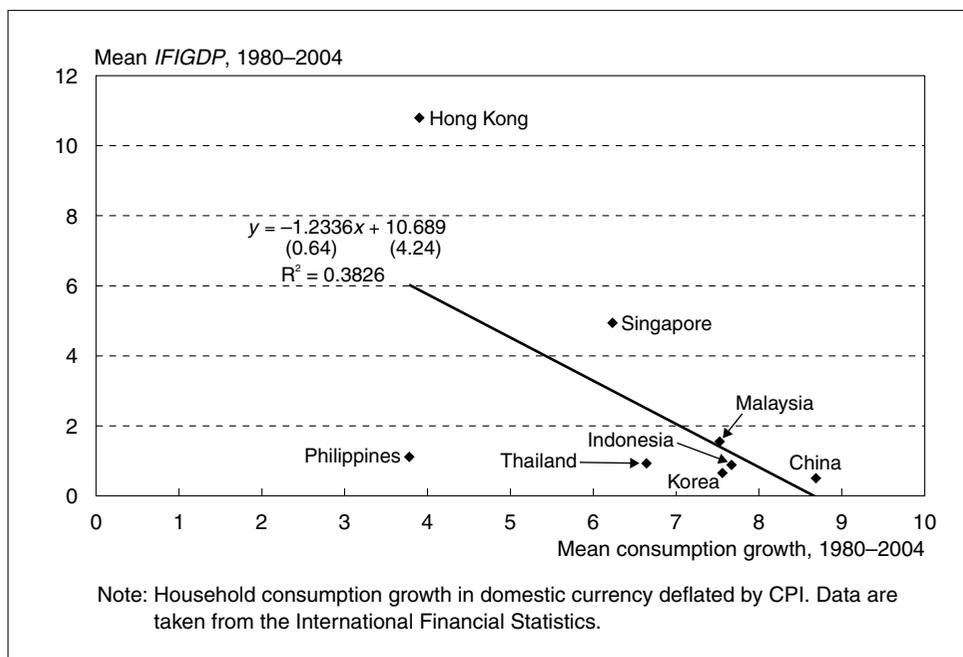
correlation falls as capital mobility increases (for a recent review and results including Asian economies, see Kim, Kim, and Wang [2007]; hereafter, KKW [2007]).[11]

Using the statistics from the OECD and Asian Development Bank, we construct a data series for the ratio of gross domestic saving to GDP (hereafter, S/Y) and the ratio of gross domestic capital formation to GDP (hereafter, I/Y).[12] We show unconditional means of S/Y and I/Y in Table 5 for three periods: 1981–2004, 1981–96, and 2000–04. The table shows large drops in I/Y in 2000–04 compared with 1981–96 in

Figure 15 Integration into World Financial Markets and Consumption Volatility

Mean *IFIGDP*, 1980–2004

$y = -17.962x + 9.7415$
   (13.92) (5.61)
$R^2 = 0.2172$

Note: Coefficient of variation of level of household consumption in domestic currency deflated by CPI. Data are taken from the International Financial Statistics.
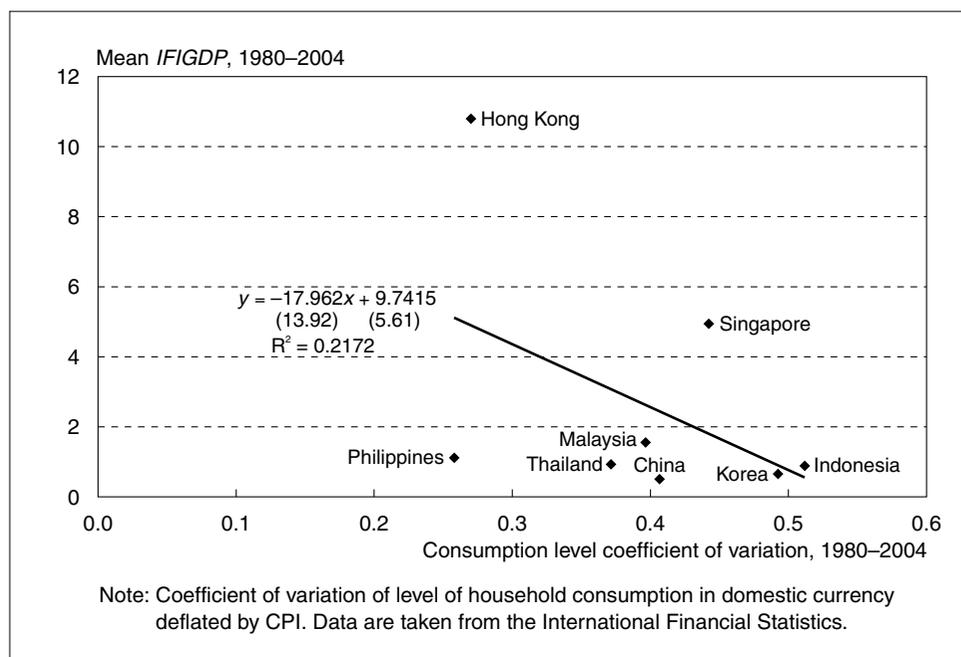
Table 5 Unconditional Mean of Saving and Investment

Sample	1981–2004		1981–96		2000–04	
	Mean (I/Y)	Mean (S/Y)	Mean (I/Y)	Mean (S/Y)	Mean (I/Y)	Mean (S/Y)
EMEAP8	30.260	33.298	31.982	32.748	25.750	33.988
(s.e.)	(7.640)	(8.778)	(7.064)	(8.231)	(7.182)	(8.280)
EMEAP	28.871	30.392	30.319	30.132	25.146	30.600
(s.e.)	(7.110)	(9.389)	(6.878)	(8.885)	(6.223)	(9.194)
All	24.851	25.036	25.532	24.738	23.087	25.332
(s.e.)	(6.486)	(8.361)	(6.825)	(8.098)	(5.150)	(8.358)
Euro11	22.394	21.281	22.416	20.967	22.324	21.573
(s.e.)	(3.982)	(3.516)	(4.133)	(3.472)	(3.674)	(3.661)

....

11. Feldstein (2005) argues that the drops in the saving-investment correlation after the mid-1990s apply to smaller OECD economies, but not to large economies. When observations are weighted by each country GDP, the saving-investment correlation remains.
12. Gross domestic savings are calculated as the difference between GDP and total consumption, where total consumption is the sum of private consumption and government consumption. Gross capital formation is the total value of gross fixed capital formation, changes in inventories and acquisitions less disposals of valuables.

the EMEAP8 and EMEAP economies. One notable exception to this trend is China, whose investment rate does not fall in 2000–04.

How should we interpret the significant drops of *I/Y* in 2000–04 that are not unique to East Asia? Prasad, Rajan, and Subramanian (2006) speculate that the post-crisis increase in savings and reduction in investment in many emerging market economies are a response of countries with weak financial systems to productivity shocks in the United States. The rise in U.S. productivity accompanied by reorganization of the global production mechanism and the global supply chain and trade has been transmitted to emerging market economies and raised their income. But the weaker financial sector in emerging markets does not intermediate additional domestic savings to domestic investment.

Armed with the annual time-series data for saving and investment from 1981 to 2004, we derive a between estimator of saving-investment correlation proposed by Feldstein and Horioka (1980), hereafter $\hat{b}$, which is an estimator for equation (1):

$$\left(\frac{1}{T}\right)\sum_{t=1}^{T}\left(\frac{I}{Y}\right)_{it} = a + b\left(\frac{1}{T}\right)\sum_{t=1}^{T}\left(\frac{S}{Y}\right)_{it} + u_{it}, \tag{1}$$

where subscript *t* denotes the period, subscript *i* denotes country, and *u* is an error term. We divide the sample into three periods: 1981–2004, 1981–96, and 2000–04. Table 6 summarizes the results.

The first row of Table 6 shows the results for EMEAP8 economies. The saving-investment correlation decreases after the Asian financial crisis, and the statistical significance becomes weak. The second and third rows of Table 6 show the results for the EMEAP economies and all economies in our sample. We confirm the reductions in the estimates of saving-investment correlations after the East Asian crisis. The fourth row of Table 6 shows results for the Euro11 economies; we see no significant saving-investment correlation, but the coefficients take negative values for the whole sample period and the subsample from 2000–04.

For the sake of a robustness check, we choose a five-year window beginning in 1981 to run rolling regressions for the EMEAP8 economies, the EMEAP economies, and all economies. The results are summarized in Figure 16. The figure shows the saving-investment correlations and their lower bound of confidence intervals—the estimates of the coefficients minus 1.96 standard errors. The saving-investment correlations started falling around 1993, and the lower bounds even became negative around the end of the 1990s.

Table 6 Saving-Investment Correlation

Sample	1981–2004		1981–96		2000–04	
	$\hat{b}$	(s.e.)	$\hat{b}$	(s.e.)	$\hat{b}$	(s.e.)
EMEAP8	0.572	0.108	0.674	0.093	0.401	0.289
EMEAP	0.521	0.071	0.625	0.064	0.302	0.183
All	0.574	0.071	0.712	0.066	0.264	0.106
Euro11	−0.080	0.438	0.438	0.405	−0.453	0.290

Figure 16 Results of Five-Year Rolling between Regressions
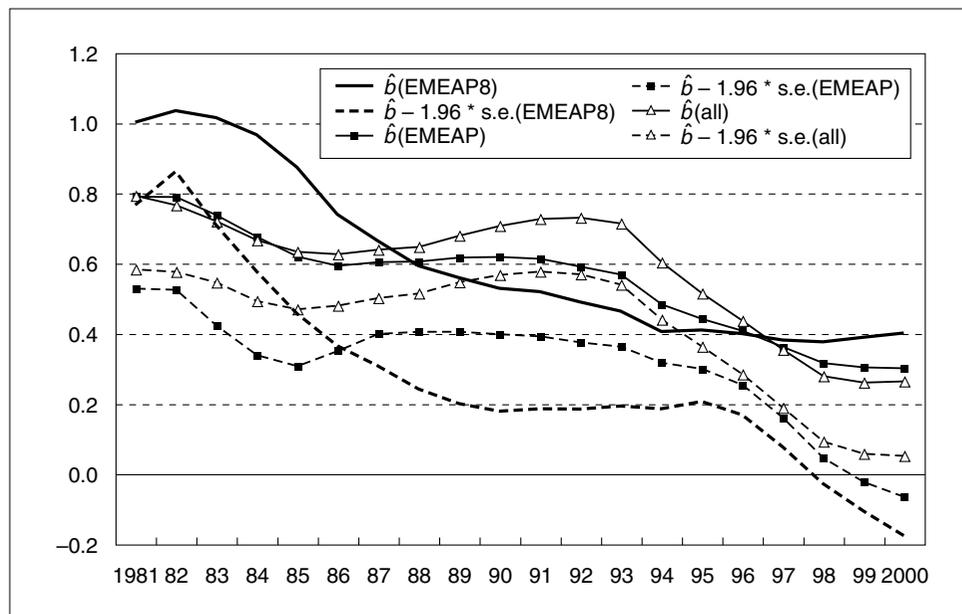
These results using the method of Feldstein and Horioka (1980) suggest the increase in the degrees of integration into world financial markets in the EMEAP economies after the Asian financial crisis, or between 2000–04. However, it is important to note that this period corresponds to the large drops in *I/Y* relative to *S/Y* in some of the EMEAP8 economies, which contradicts the theoretical prediction that greater integration into world financial markets leads to capital flowing from capital-rich economies to capital-poor ones.

C. Risk Sharing

Integration into world financial markets allows economies to share their idiosyncratic risks in consumption and improves welfare. Empirical investigations on this point are abundant both for international and intranational risk sharing. Kalemli-Ozcan, Sørensen, and Yosha (2003) find, for example, that the fraction of idiosyncratic shock smoothed by cross-holding of financial assets (*ex ante* insurance) in the euro area was 9 percent for the period between 1993 and 2000—a significant increase from small and/or almost negative estimates for the preceding years—possibly due to the creation of the euro area. The general findings in the literature are scarce international risk sharing, where home bias in asset holdings is prevalent and consumption smoothing takes place essentially through domestic saving, and richer intranational risk sharing, where the role of capital markets sometimes became preponderant.

Motivated by the evidence of increasing integration into world financial markets for the EMEAP economies in the previous sections, next we examine whether consumption risk sharing has improved in the region. We examine the extent of risk sharing through two methods: that of ASY (1996) in the international context, and that of Ravallion and Chaudhuri (1997).

1. International risk sharing based on ASY (1996)

ASY (1996) propose the decomposition of cross-sectional variance in the gross product of an economy (originally applied to that of U.S. states) into four parts: fractions of shocks to gross state product smoothed via capital markets, fractions of shocks to gross state product smoothed by the federal fiscal system, fractions of shocks to gross state product smoothed by credit markets, and an unsmoothed residual fraction. Sørensen and Yosha (1998) advanced ASY (1996) to an international setting and analyzed consumption smoothing among the European Community (EC) and OECD economies during the period from 1966 to 1990. They find that the contribution of cross-economy factor income flows to cross-economy risk sharing among EC as well as OECD economies is not significantly different from zero.[13]

For an application of Sørensen and Yosha (1998) to Asian economies, KKW (2006), among others, report that the credit market channel is more important than that of the international capital market. For the sample of 10 Asian economies from 1970 to 2000, they find that about 20 percent of the shocks to income are smoothed through the credit market channel while almost no smoothing takes place through the international capital market, leaving the rest unsmoothed. We first extend their analysis to EMEAP economies including more recent data to see whether this *ex ante* insurance via asset markets is in fact insignificant.

Following Sørensen and Yosha (1998), suppose that GDP for each economy is a homogeneous tradable good and an exogenous random variable. Suppose further that the representative consumer in each economy is an identical risk-averse expected utility maximizer who obtains utility from consumption. If the utility function is in log form, under full risk sharing, consumption of each economy co-moves with world consumption, but does not co-move with an economy-specific GDP shock.

Suppose there is an international capital market and a citizen in one economy can own claims to GDP in the other economies, say, through stockholding, and the cross-economy factor income flow can smooth the income of the citizen in the lend-ing economy. In that case, under full risk sharing, the GNP of the lending economy co-moves with the world consumption. Even if the risk is not fully shared through cross-economy factor income flows, suppose there is a credit market. Then a citizen can smooth consumption via savings and dissavings using the credit market, for example, through bank deposits, and under full risk sharing, and consumption of each economy co-moves with world consumption as a result. We consider the consumption allocation under full risk sharing as a benchmark, and measure the fraction of shocks to GDP absorbed by the international capital market channel and credit market channel through the variance decomposition explained below.

We consider the GDP identity for any period t. Shocks to GDP are decomposed into two factors as follows.

$$GDP_i = \frac{GDP_i}{GNP_i} \frac{GNP_i}{C_i} C_i, \qquad\qquad (2)$$

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13. See also Mélitz (2004) for a useful survey of the literature, especially regarding evidence from European economies.

where all the magnitudes are in per capita terms, and i is an index of the economies.[14] Following KKW (2006), equation (2) can be transformed to estimate the following panel equation system (3) with seemingly unrelated regression (SUR).

$$\Delta \log GDP_{i,t} - \Delta \log GNP_{i,t} = d_{kt} + g_k \Delta \log GDP_{i,t} + e_{i,kt},$$

$$\Delta \log GNP_{i,t} - \Delta \log C_{i,t} = d_{ct} + g_c \Delta \log GDP_{i,t} + e_{i,ct},$$

$$\Delta \log C_{i,t} = d_{ut} + g_u \Delta \log GDP_{i,t} + e_{i,ut}. \tag{3}$$

We interpret the degree of overall income and consumption smoothing against idiosyncratic regional shock to GDP of economy i as measured by three sources: (1) the fraction of idiosyncratic shock smoothed by cross-holding of financial assets (*ex ante* insurance) measured by g_k; (2) the fraction of idiosyncratic shock smoothed by the changes in savings and dissavings typically instigated by the credit markets after the realization of idiosyncratic shock, measured by g_c; and (3) the fraction of idiosyncratic shock unsmoothed (namely, deviation of international consumption patterns from the full risk-sharing allocation) measured by g_u and $g_k + g_c + g_u = 1$.[15]

Regarding the first source, if full risk sharing is achieved through international capital market channel, GNP of the economy co-moves with the world consumption and GNP is orthogonal to GDP of that economy. In this case, we get $g_k = 1$.

Regarding the second source, if full risk sharing is achieved through the combination of the international capital market and credit markets, consumption of each economy co-moves with world consumption. In this case g_c measures the incremental fraction of shocks to GDP smoothed via savings and we get $g_k + g_c = 1$, $g_u = 0$. Time fixed effects in equation (3), d_{kt}, d_{ct}, d_{ut}, play a crucial role to capture the year-specific effects on the GDP growth rate, presumably the aggregate shocks to GDP of each economy.

The first row of Table 7 shows the result for the period between 1981 and 2004. The credit market plays a larger role in smoothing shocks to GDP in the EMEAP8 economies with more than 30 percent (the estimate of g_c), while only about 6 percent of the shock to GDP is smoothed through the international capital market (the estimate of g_k). Moreover, the larger values of standard errors for the parameter

Table 7 Estimation Result of Equation (3) (1981–2004)

	g_k	g_c	g_u
EMEAP8	0.062 (0.062)	0.308 (0.124)	0.622 (0.068)
Euro10	0.160 (0.124)	0.240 (0.128)	0.603 (0.126)
G-7	0.030 (0.111)	0.169 (0.177)	0.801 (0.177)
EMEAP, the United States, and the Euro10	0.060 (0.051)	0.303 (0.079)	0.636 (0.053)

Note: Standard errors are in parentheses. The Euro10 economies include 10 countries excluding Luxembourg, Greece, and Slovenia.

14. We ignore the role of international government transfer in the following analysis following KKW (2006).
15. Note that the last equation of equation (3) is almost the same as Cochrane's (1991) empirical model, which measures whether the consumption of economies responds only to aggregate shocks or not. The focus here is the measurement of the fraction of region-specific GDP shocks absorbed through the various channels of international insurance.

reported for the estimate of g_k suggest that the smoothing effect from the international capital market is weak.[16] This trend—the credit market being more important in Asia—is consistent with the finding of KKW (2006) and Jeon, Oh, and Yang (2005).[17]

Meanwhile, this trend is somewhat weak for 10 euro area economies for the same period. As the second row of Table 7 shows, about 24 percent is smoothed via credit markets while 16 percent, more than double that of EMEAP8, goes through the international capital market, although the larger value of standard error for the parameters prevents us from taking the results at their face value.[18] One might claim that the Asian economies are financially integrated more with the United States and the euro area rather than their neighbor economies in Asia, and these financial centers should be included in the estimation. The results for risk sharing among EMEAP (all 11 economies), the United States, and the euro area combined are quite similar to the results based on the EMEAP8 economies.

Figure 17 (the three panels) show the results of estimation of equation (3) respectively using 10-year subsamples. Figure 17 shows that the fraction smoothed through the credit market channel peaked during the window of 1983–92, when major financial deregulation, particularly in the banking sector, took place in Asia. Meanwhile, the fraction smoothed through the international capital market, g_k, was close to zero, and even experienced a sharp drop into negative territory from the mid-1980s to the early 1990s windows. The drops in the 10-year subsamples beginning from 1988 may be partly due to the Asian crisis with the reversals of international capital inflows. While g_k experienced a dramatic increase reaching above 30 percent of the total shocks to GDP, its significance is doubtful as g_k is not significantly different from zero when looking at the 95 percent confidence interval.

Figure 18 (the three panels) reports the result using all sample economies including the Euro10, EMEAP, and the United States. The result is similar to the result in Figure 17 based on the EMEAP8 economies. This result seems to be consistent with the finding by Kim, Lee, and Shin (2006), arguing that the economies of the Asian region are more integrated with global markets than with each other. It may be fair to say, then, that what is developing in the region reflects what is happening in the global market. These findings further confirm those found in the previous literature—the credit market channel is more important than that of the international capital market, and the degree of risk sharing among the EMEAP8 is far from complete, because the unsmoothed part of consumption against the idiosyncratic shock is around 60 percent on average according to our results.

2. International risk sharing based on Ravallion and Chaudhuri (1997)

We cross-check the result in the previous subsection using another way of measuring the degree of risk sharing. Ravallion and Chaudhuri (1997) propose a way to measure a degree of village-wide risk sharing by examining household-level consumption and

16. Our national account and population data are taken from the International Financial Statistics, while the purchasing power parity is from the Penn World Table. It is better to use GNP statistics that include the cross-economy factor income flow from the economies under consideration alone to be consistent with the theoretical model, but currently GNP statistics do not report the country breakdown of factor income from other economies.

17. Each of the smoothed portions in their estimate is about half those of ours, mainly because of the difference in the deflator used and partly because of the difference in the countries included.

18. See also Sørensen and Yosha (1998), though for a different sample period.

Figure 17 Rolling Estimation Result of Equation (3) (EMEAP8)

g_k

g_c

g_u

Note: Estimation results using a window of 10 years for the EMEAP8. Dotted lines
indicate 1.96 * standard error plus/minus the estimated coefficients, g_k, g_c, and g_u.
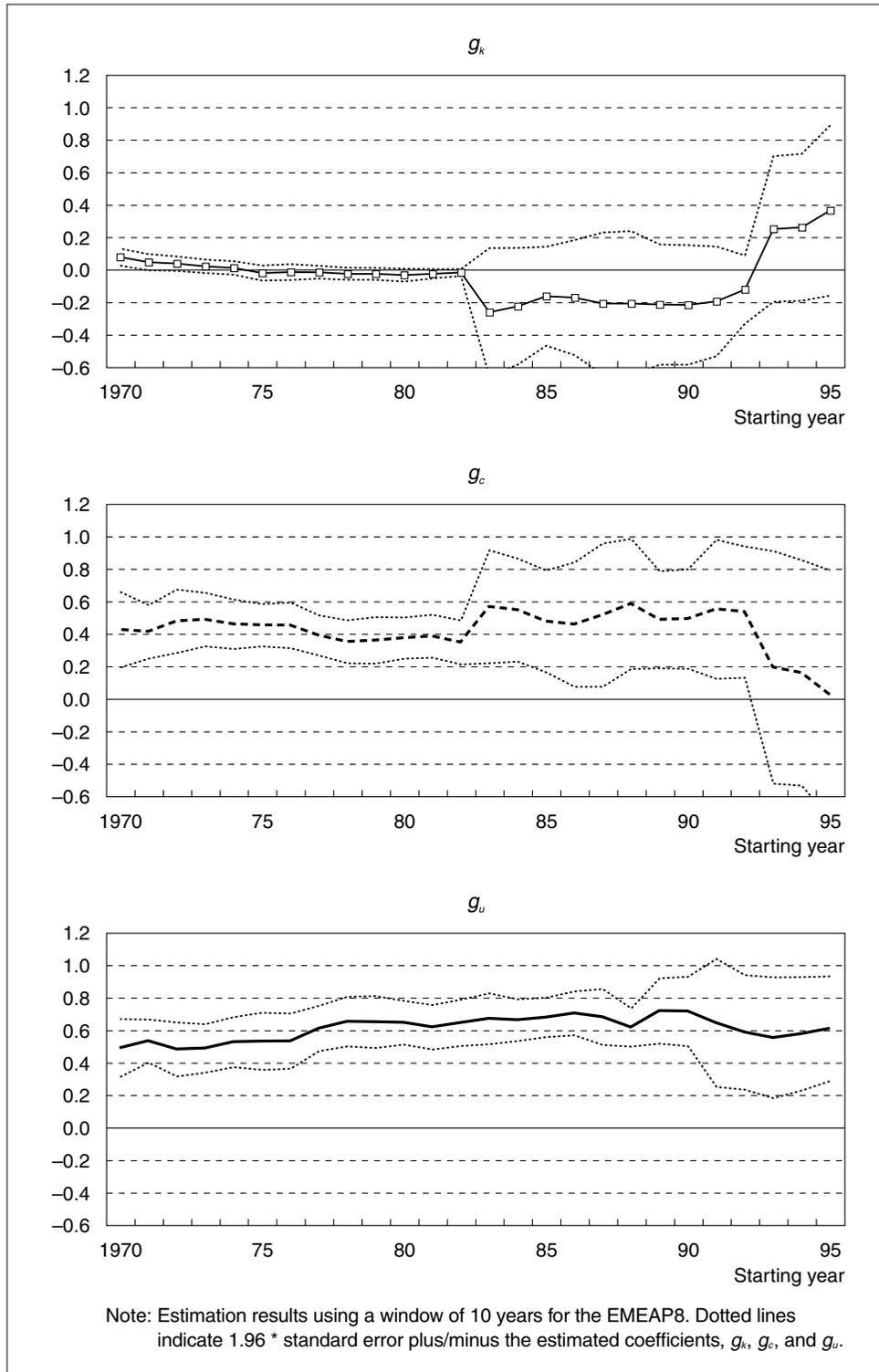
Figure 18 Rolling Estimation Result of Equation (3) (Euro10, EMEAP, United States)

g_k

g_c

g_u

Note: Estimation results using a window of 10 years for the Euro10, EMEAP, and the United States. Dotted lines indicate 1.96 * standard error plus/minus the estimated coefficients, g_k, g_c, and g_u.
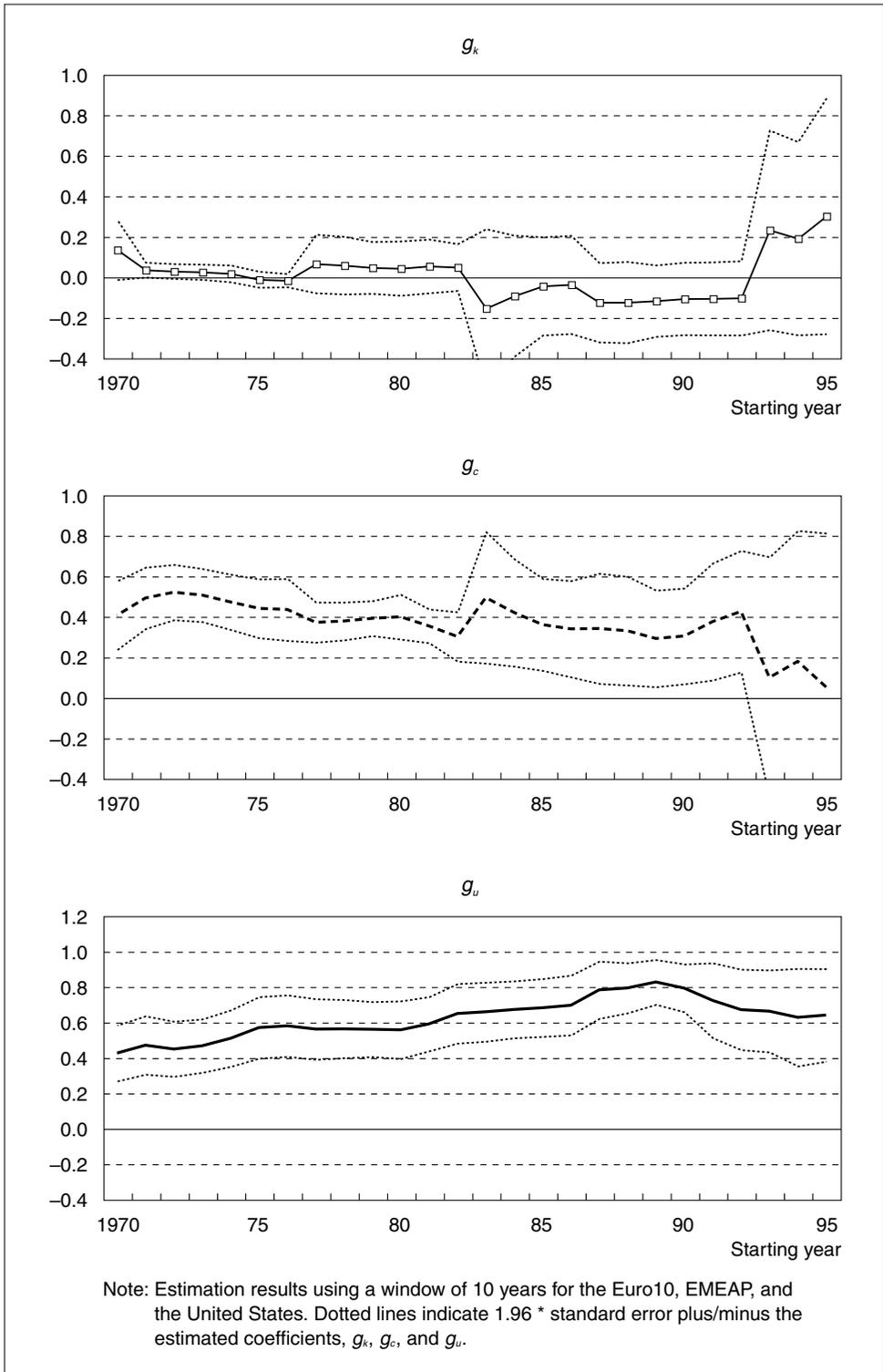
income data taking into account the labor-leisure choice of households. They posit that if the co-movement in consumption across families is being driven by risk sharing, and if the correlation between individual consumption changes and income changes is due to endogeneity of the labor-leisure choice, then the associated individual household consumption changes being correlated with aggregate income changes because the risk sharing implies the pooling of incomes.

We apply their setup to risk sharing among the EMEAP8 economies. Specifically, we estimate the following equation (4):

$$\Delta \log C_{i,t} = \beta \Delta \log GDP_{i,t} + \alpha \overline{\Delta \log GDP_t} + \epsilon_{i,t}, \qquad (4)$$

where $\overline{\Delta \log GDP_t} = 1/N \sum_{i=1}^{N} \Delta \log GDP_{i,t}$ where N stands for the number of economies. Equation (4) is equal to the third equation of equation (3) if we replace the second term, $\overline{\Delta \log GDP_t} = 1/N \sum_{i=1}^{N} \Delta \log GDP_{i,t}$, with the time dummy variable d_{ut}. Hence, we should expect $\beta = g_u = 1 - (g_k + g_c)$.

The coefficient β, attached to domestic output growth, measures the deviation from the risk-sharing arrangement, and the orthogonal coefficient α, attached to average output growth, measures the extent of risk sharing within the group of economies under consideration.

Table 8 reports the results for estimation of equation (4) using the data on the EMEAP8 economies for the whole sample period from 1981 to 2004 and by decade.[19] For all the regression estimations, the estimates of β are more significant than those of α, suggesting that while changes in an economy's income have a significant effect on its consumption, the effect of changes in the sample mean income differs from period to period. The estimates of β based on the sample period from 1981 to 2004 are close to the estimates of g_u in Table 7. The degree of international risk sharing as explicitly captured by α does seem to increase in recent years, as has also been indicated by the estimation of equation (3). The significance of these coefficients may not be very robust when looking at the short subsample period with the higher standard errors accompanying the results, which is also consistent with the previous analysis.

Table 8 Estimation Result of Equation (4) for EMEAP8

Sample	Country i GDP (β)	(s.e.)	EMEAP8 average GDP (α)	(s.e.)	Wald test ($\chi^2(2)$)
1981–2004	0.608	(0.057)	0.206	(0.071)	203.34
1980s	0.627	(0.063)	0.037	(0.092)	196.72
1990s	0.777	(0.088)	0.195	(0.112)	280.55
2000s	0.498	(0.128)	0.292	(0.133)	45.45

Note: The coefficient β, attached to domestic output growth, measures the deviation from risk-sharing arrangement for idiosyncratic GDP shocks within the economies, and the coefficient α, attached to aggregate output growth, measures the extent of risk sharing within the group of economies under consideration.

19. All variables in the regressions are real in domestic currency and in per capita terms.

D. Summary and Reservations

1. Summary

The analyses in Section III provide us with supporting evidence for integration into world financial markets, and more limited progress in risk sharing within the EMEAP economies than economic theory suggests.[20] Specifically, casual two-way plots between integration into world financial markets and several macroeconomic variables do not support the prediction of reduction in relative consumption volatility.

Testing the saving-investment correlation proposed by Feldstein and Horioka (1980) suggests a significant increase in the degree of international capital mobility in the EMEAP economies during the years after the Asian financial crisis, but the saving-investment correlation in the EMEAP economies is higher than that in the euro area economies. As for the international risk sharing, the analysis based on ASY (1996) and Ravallion and Chaudhuri (1997) both indicate a possible increasing level of financial integration within the EMEAP8 economies. The significance of these results remains to be addressed, however.

2. Reservations

Why does the increased integration into world financial markets not lead to clear-cut empirical evidence for better risk sharing and improvement of welfare in the EMEAP economies? Regarding this question, several points are worth attention.

First, the decreasing saving-investment correlation coefficient, $\hat{b}$, that we find is subject to various explanations depending on which economic models we rely on. Thus, there are other ways of interpreting the result than the increase in financial integration. The Asian financial crisis, for example, forced current accounts to reverse in the affected economies, which would point toward the reduction of the saving-investment correlation coefficient. Furthermore, the collapse of investment in recent years in most of the EMEAP8 economies with the exception of China contradicts the progress of financial integration. To facilitate understanding of the correlation, van Wincoop (2000) suggests controlling for common factors or global supply of funds. After controlling for the common factors, he claims that the saving-investment correlation approaches zero if markets are integrated.

Second, the framework for measuring risk sharing may not be appropriate. Because of the rapid accumulation of foreign reserves, particularly during the post-crisis period, one might argue that "self-insurance" has occurred, and it is not surprising that international risk sharing of idiosyncratic shock is empirically insignificant.[21] In this

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20. This main message—that global integration progresses, whereas regional integration remains weak—appears a robust one, as it is supported by other studies on financial integration using different integration measures, with a few exceptions. For example, Forbes and Chinn (2004) find that stock returns have quantitatively important impacts on five major Asian economies, and the significant impacts result from the direct trade linkage. Eichengreen and Park (2003) use a gravity model to explain the patterns of consolidated international bank claims reported to the Bank for International Settlements that shows slower financial integration in Asia. In contrast, Eichengreen and Luengnaruemitchai (2006) use a gravity model to explain the patterns of bilateral international portfolio holding measured by the IMF for 2001 to 2003. They find that the Asian bond markets are more integrated than a randomly selected pair of bond markets, holding other determinants of the bilateral international portfolio constant.

21. As the EMEAP8 economies have been increasingly integrated as a way of production chain in trade, an idiosyncratic shock to one of final goods originating from the non-EMEAP8 economies may spread over the other EMEAP8 economies, producing the intermediate input to the final goods. In this regard, a common shock in the region might be a more relevant one to examine than an idiosyncratic shock, and one may interpret the rising estimates of α in equation (4) as the result of the evolving production chain in the region.

regard, the EMEAP economies might have resorted to an alternative mechanism, or self-insurance through accumulation of assets, which requires an adjustment in consumption to idiosyncratic shocks.

Alternatively, if the risk-sharing framework is based on incomplete financial markets instead of a complete market as is often the case in the previous studies, the level of risk sharing to be expected might be much lower. Bai and Zhang (2005), for example, argue that the progress in financial integration would not lead to better risk sharing if it is accompanied by an increase in the probability of default. For the risk sharing to occur, a country would need a much higher level of capital flows than the level that is conventionally understood.[22,23] In this regard, we admit that there are other benchmarks or the expected level of risk sharing to base our priors.

The third point is the endogeneity of the quality of institutions, known as "collateral benefits" to the integration into world financial markets. "Collateral benefits," proposed by Kose *et al.* (2006), consists of a broad set of economic fundamentals that provide the benefits of integration into world financial markets in addition to the traditional channels (e.g., capital accumulation). The collateral benefits, such as development of the domestic financial sector, improvements in institutions, and better macroeconomic policies, would play a dual role: they are prerequisites for the financial integration to occur, and a catalyst for higher growth and lower volatility.

The collateral benefits as a prerequisite may be there for the EMEAP8 economies, but the level may not have achieved the "threshold" as in Kose *et al.* (2006) or be sufficiently high to serve as the catalyst for higher growth. For example, compared with the euro area economies, the EMEAP8 economies so far have achieved only limited development toward a regional capital market, regional international institutions, and regional common economic policies. A composite opacity index presented in Gelos and Wei (2005) indicates that the degree of opacity in areas such as accounting standards, macroeconomic policies, and legal systems of the average EMEAP economies is below the average of 30 developing economies if Singapore and Hong Kong are excluded.[24]

IV. Implications for the Future of Currency Union in the East Asian Economies

Can we learn any implications for the future of a currency union in the East Asian economies? Our empirical results suggest that ample room remains for improvement

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22. Wyplosz (2007) interprets the accumulation of reserves by the EMEAP8 economies to mean that they have decided to trade off the benefits from an export-led strategy, based on exchange rate stability and external competitiveness, against the probability of renewed speculative attacks. If the probability is low enough, which we do not know, the choice is reasonable. Wyplosz (2007) agrees that accumulating foreign exchange reserves is one way of bringing down the probability, but warns that it is easy to imagine how a domestic financial distress or serious political turmoil could precipitate a speculative attack on the currency.
23. Another possible explanation for lower expected risk sharing in the context of incomplete financial market is a weak enforcement issue.
24. The data are originally constructed by PricewaterhouseCoopers. The index is presented for only six economies; Hong Kong, Indonesia, Korea, the Philippines, Singapore, and Thailand. See the details in table AII, column 2 of Gelos and Wei (2005).

in intra-regional risk sharing and welfare in East Asia.[25] Specifically, compared with the euro area economies, we find a higher saving-investment correlation, a lower degree of the fraction of idiosyncratic shock smoothed by cross-holding of financial assets, and a limited extent of risk sharing within the EMEAP8 economies.

Given the lack of area-wide alternative mechanisms to cope with economy-specific shocks, such as coordinated fiscal policy and measures to make labor markets flexible, our evidence against the consumption smoothing mechanism via the international capital market and a credit market in Asia suggests that it is unlikely that a currency union in East Asia is a feasible solution, because a currency union takes away an important adjustment mechanism against idiosyncratic shock, namely, the adjustment of the bilateral nominal exchange rate.[26]

Note that we examine the degree of financial integration in the context of preparedness for some currency union in the EMEAP economies. This analysis, however, poses a question on the role of a common currency promoting financial integration—causality running from an opposite direction. While economies should be integrated to some extent before forming a currency union, it is generally understood that, particularly in the case of the euro area, the introduction of a common currency, the euro, helped significantly to promote further integration. In this sense, other factors should complement the degree of financial integration in judging the readiness for a currency union.[27]

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25. Note that the integration into world financial markets is only one of the many important conditions for a currency union, such as the flexibility of the labor market and international transfer system to cope with an economy-specific shock. Moreover, the Asian economies do not have common strong political leadership moving toward a currency union, compared with the European economies. The lack of clear regional leadership leads some economists to wonder if China or Japan would really participate in such a union if it is ever created. For example, Fischer (2006) expects that the non-Chinese members would like to have a common currency so that they can achieve some impact on region-wide monetary policy, but it is unclear whether China would agree to such a currency. Fischer (2006) also expects that Japan would play an independent role by retaining its currency, rather like the United Kingdom currently does in Europe.

26. We do not deal with the debate over the appropriateness of the basket-peg proposal for Asian economies, because papers in the debate generally focus on trade integration, rather than integration into world financial markets. We list a few studies on the pros and cons for the basket peg below for reference. Kawai (2002) argued that (1) a system which ensures intra-regional exchange rate stability will be beneficial for emerging East Asia to promote trade, FDI, and economic growth; (2) given the high degree of intra-regional trade and the rising similarity of trade composition in East Asia, each economy's exchange rate policy should be directed toward maintaining intra-regional exchange rate stability (see Branson and Healy [2005] for the same argument and see the opposite argument in Sa and Guérin [2006]); and (3) the diverse economic linkages of emerging East Asia with the rest of the world suggest that exchange rate stabilization *vis-à-vis* a well-balanced currency basket comprising the U.S. dollar, yen, and euro is a reasonable option. Ogawa and Kawasaki (2006) examine the cointegration relationship among real effective exchange rates and find that after the East Asian crisis the yen became one of the currencies in the currency basket that stabilized the other Asian currencies. They argue that the results suggest the common currency basket arrangement for the ASEAN+3 economies should include Japan. Yoshino, Kaji, and Suzuki (2004) provide an example that the choice of exchange rate regime depends on the choice of policy objectives, and a basket peg with trade weight in general is not the best choice. Shioji (2006) examines the optimal weight for East Asia's currency basket peg to the dollar and the yen based on a three-economy version of the new open-economy macroeconomics model for Asia, Japan, and the United States. According to his model, the weight of the basket peg depends not only on the trade share that the traditional literature on the basket peg emphasizes, but also on the choice of the invoicing currency. Shioji (2006) concludes that under the invoicing currency pricing, East Asian economies should assign more weight to the yen, rather than the standard assumption of the seller's currency pricing. His results highlight the importance of the understanding on the choice of invoice currency and the degree of pass-through in Asia. See Parsons and Sato (2005) and Ito and Sato (2006) on the degree of pass-through.

27. A related issue is the reference region to use. We examine the euro area as a reference region, but if the endogeneity of the currency union is really significant, then the reference should be the region where a currency union has not been put into place. Regions such as Latin America might be relevant in this regard.

V. Concluding Remarks

This paper examines the degree of integration into world financial markets and its impacts on several key macroeconomic variables for selected East Asian economies, and draws policy implications. According to our analysis, the degrees of integration into world financial markets in those economies are increasing. Regarding the impacts of increasing integration into world financial markets on several macroeconomic variables, we find three results. First, casual two-way plots among macroeconomic variables do not support the theoretical prediction of reduction in relative consumption volatility. Second, the saving-investment correlation is higher than those of the euro area economies. Third, the degrees of smoothing of idiosyncratic shock by cross-holding of financial assets are lower than in the euro area economies. These results suggest two policy implications. First, there is some room for improvement in welfare gains in those economies by means of further risk sharing. Second, holding all other conditions equal, the increasing integration into world financial markets alone is unlikely to provide sound grounds for a currency union in East Asia at this stage.

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Comment

SHAGHIL AHMED

Board of Governors of the Federal Reserve System

Thank you first of all to the organizers for inviting me and giving me the opportunity to discuss this paper. My views, of course, are my own, and are not meant to reflect the views of the Board of Governors of the Federal Reserve System.

I. Summary of the Paper

I am going to begin with a summary of the paper—there are many results, so I will just go through this quickly. This paper looks at financial integration in East Asia and its implications in a variety of different ways, and comes up with some interesting results.

The primary focus of the paper is on the emerging market members in the Executives' Meeting of East Asia-Pacific Central Banks (EMEAP) group, an organization of central banks and monetary authorities. The emerging market members of this organization are Indonesia, Malaysia, the Philippines, Singapore, Thailand, China, Hong Kong, and Korea, and most of my comments will focus on the results for these economies.

In the first part of the paper, the authors look at how the degree of financial integration has changed in these economies over time. The main results are as follows. (1) The *de facto* measures based on the analysis of actual external assets and liabilities show an increasing trend of financial integration. (2) In terms of capital structure, the decomposition of assets and liabilities varies from country to country. (3) *De jure* measures, which are computed based on reported capital and current account restrictions, show some reversal of financial integration in the 1990s.

In the second part of the paper, the authors turn to the effects of financial integration on the economies of the countries under study. Starting with the macroeconomic effects, they find little evidence of the theoretically predicted direct positive effects of financial integration on growth—either on consumption growth or on output growth. Using the Feldstein and Horioka (1980) method, they also document that investment-saving correlations have declined in these economies, a result which

is consistent with a greater degree of capital mobility. However, the investment-saving correlations remain higher in these economies than those in the Euro11 economies.

The authors then look more directly at risk-sharing implications of East Asian financial integration. They find that the EMEAP8 economies are able to achieve only limited smoothing of GDP shocks. Interestingly, there appears to be little by way of cross-sectional (international) risk sharing.

The third part of the paper considers the policy implications of the empirical results. In this respect, the authors conclude, first, that there is room for considerable welfare gains by more risk sharing, and, second, that it is unlikely that a currency union is feasible in East Asia right now.

In terms of the organization of my comments, I do not really have any major objections to the methodology. I would prefer to spend my time first raising some questions about the interpretation of some of the results; then I would like to suggest, based on some other findings in the literature, some additional lines of inquiry that might be potentially fruitful to consider; and finally I would like to make a couple of observations on the issue that is raised about the appropriate choice of exchange rate regimes in East Asia.

II. Interpretation of the Results

One of the results that I found really interesting, and others have also reported this kind of result, is that *de jure* and *de facto* measures make a difference in conclusions about the degree of financial integration. The authors' conjecture is that this has something to do with the reimposition of controls on capital inflows in Indonesia and Malaysia. But my impression is that this result is more broad-based than just these two countries, and in any case, if such controls were successful, we should not necessarily see a divergence between the *de jure* and *de facto* measures. This diversion indicates to me either a lack of enforcement of the controls or that markets somehow find a way around the restrictions.

There is a reason I bring this up. I agree that normally and, for the most part, we would want to focus on *de facto* measures of integration when looking at the effects of financial integration, which is what the authors do. But *de jure* measures, suggesting the need to have restrictions in the first place, can sometimes be an indicator of general problems in the economy. If these measures might be a good proxy for some of the underlying economic problems, then it might also be fruitful to look at the effects of *de jure* measures, because the results might shed light on how these problems are constraining various things, such as economic growth.

My second comment on interpretation has to do with one of the key conclusions the authors make, which is that there is not much evidence of international risk sharing among the EMEAP8 economies. Now, this is true for most of their results, but there is one result in the paper, which I found very intriguing and which suggests that the picture may have changed in the mid-1990s. The authors did not bring up this result in their presentation here, but I would like to comment on it. The result concerns their estimates of the g_c and g_k coefficients in equation (3) in their paper,

using 10-year rolling window regressions. Recall that these coefficients represent, respectively, the fraction of GDP shocks smoothed through credit markets and through cross-sectional (international) risk sharing. The results are presented in Figure 17 of their paper. The authors find that, for rolling windows starting in 1992, the fraction of GDP shock smoothed through cross-sectional (international) risk sharing rises dramatically, to nearly 40 percent for the 1995 to 2004 window. In contrast, the fraction of shocks smoothed through credit markets diminishes. Either there is a special factor or a particular feature of the specific methodology used that is accounting for this result, or there is a real story here that is not being emphasized enough in the paper. It would be important to know the reasons for this particular result, since it appears to be one result that is going against a major conclusion of the paper.

Another point about interpretation I would like to make is that the facts that there are few risk-sharing benefits and we find no direct effect on economic performance do not necessarily imply there are no benefits. As has been pointed out in the literature— for example, by Kose *et al.* (2006)—even if the benefits of the usual textbook kind may be small, there are indirect "collateral" benefits, which could be much bigger. These effects might be difficult to identify, though, because some "preconditions" or "threshold effects" are, in turn, required for these collateral benefits to kick in. Actually, the authors are well aware of this and they discuss this point in the paper, but they end up concluding that these collateral benefits are not much in evidence in the countries studied, and thus, that the required preconditions do not exist. But how can we really tell? As I said, it can be very difficult to identify the collateral benefits, and this needs to be looked into more. Just from the fact that we are not finding risk sharing, we cannot say that these collateral benefits do not exist, because there is a lot of home bias even in European countries, for example. Also, a reading of the "preconditions" literature—such as Chinn and Ito (2006)—suggests, to me at least, that the preconditions are a set of minimal requirements on financial development and development of legal institutions, which are likely to be satisfied in these "tiger-status" countries, so I was not convinced by the conclusion that the benefits of financial integration are only very limited in these countries and this point is, perhaps, debatable.

III. Possible Extensions

Turning to other things that the authors could fruitfully look at, note that the traditional benefits of capital mobility emphasized in economic theory might not be observed in the real world because, as has been pointed out often, capital is flowing in the wrong direction—that is, from developing countries to developed countries. This certainly applies to the ASEAN+3 countries as well. They collectively had a current account deficit of US\$35 billion in 1996, and a surplus of US\$360 billion in 2006, which made them net exporters of capital. However, in addition to looking at the sum of external assets and liabilities and at capital structure, as the authors do, it might be useful to consider inflows and outflows separately. For some questions, such as the degree of risk sharing, you might want to just take the sum of the external liabilities and assets, as they do. But for other questions, such as the growth effects, it

should matter more which direction the capital is flowing in and what the net capital flows are. So, in terms of growth effects at least, it would be useful to have an analysis of the inflows and outflows and of the net flows separately as well, rather than just the sum of the assets and liabilities.

Since the dataset the authors use allows this, a further decomposition of equity capital flows between portfolio equity flows versus foreign direct investment (FDI) flows would also be useful to look at. FDI, many people argue, should have more beneficial effects, both because it entails a transfer of technology and managerial expertise and because it is the least volatile of the various types of capital flows. Researchers are generally hard-pressed to find bigger benefits of FDI in the data though, and so it would be interesting to see what we observe with respect to these EMEAP8 countries on the effects of FDI versus portfolio equity flows—are the effects any different? (There is another paper coming up on direct investment later in the conference, by Ahn and Lee [2007], which might shed light on this.)

IV. Exchange Rate Regime Issues

I would like to make just two comments on the exchange rate regime issues raised in the paper. One of the policy implications the authors draw is that a currency union for East Asia is not appropriate at the present time, at least. And the argument goes something like this: since adequate risk-sharing is not occurring, implicitly capital is not mobile enough; thus, in the absence of other adjustment mechanisms, flexibility of the exchange rate can potentially play a greater role in providing a more appropriate adjustment of the economy to various shocks. I am sympathetic to this conclusion.

There are a couple of issues that are particularly important with respect to these countries when looking at the choice of exchange rate regimes. First, what is the importance of common or regional shocks versus country-specific shocks in these countries in the first place? The original optimal currency area literature focused not just on factor mobility as providing as appropriate adjustment mechanism, but also on the degree to which there are common shocks. A set of countries could be an appropriate group for a common currency area if either there were other adjustment mechanisms than movements in the exchange rate available (e.g., factor mobility) or if the countries by and large had the same set of shocks and thus may not need an independent monetary policy so much. With the greater fragmentation of international production across borders and the higher degree of vertical specialization in trade taking place in East Asia, the common influences on the region may be increasing and this would be very interesting to look at. The question of regional shocks versus country-specific shocks is also important for another reason: the literature often brings up the degree of inter-regional risk sharing versus intra-regional risk sharing, arguing that the extent of intra-regional risk sharing is much less than the extent of inter-regional risk sharing. The importance of country-specific shocks would give us some idea of the scope or potential for intra-regional risk-sharing—it would allow a setting of the benchmark and then one could see how far we are from the optimal potential scope of intra-regional risk sharing.

The second issue with respect to exchange rate regimes of the East Asian countries I would like to bring up is the role of China. This can be very important. With China's reluctance to have more exchange rate adjustment, the other East Asian economies are forced into a similar predicament to maintain competitiveness. Thus, the extent to which the exchange rate policies in these economies are constrained by China's exchange rate policy is important. Of course, this just puts the question back of why China does not allow more exchange rate adjustment, which still has to be answered.

V. Conclusion

In conclusion, I think this paper has done a lot of work in studying financial integration in East Asia from many different angles and using different empirical methods. The findings corroborate to a large extent others' findings with respect to developing countries more broadly. I did have some questions about aspects of the interpretation of results, which I have shared here, and some suggestions for even more things to do, which is the job of all discussants to point out. Thank you.

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Comment

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I would like to express my gratitude to the organizer, the Institute for Monetary and Economic Studies of the Bank of Japan, for inviting me to this very stimulating conference as a discussant of the paper by Drs. Fujiki and Terada-Hagiwara. Though I work for the ADBI, a subsidiary organization of the Asian Development Bank (ADB), my views are entirely personal and do not necessarily represent the ADB or the ADBI.

I. Introduction

The authors' interesting paper attempts to measure empirically the degrees of financial integration of emerging East Asian economies—what the authors call the EMEAP8:

China, Hong Kong, Korea, Singapore, Indonesia, Malaysia, the Philippines, and Thailand. The Executives' Meeting of East Asia-Pacific Central Banks (EMEAP) comprises 11 members—the EMEAP8, Japan, Australia, and New Zealand—but excludes low-income ASEAN countries and Taipei,China. The main focus of the paper is the EMEAP8's integration with the global financial markets, rather than their mutual financial integration or their integration with a wider East Asian group—including the EMEAP8; Japan; Taipei,China; and other ASEAN countries—or with India. There are some discussions on the exchange rate issue and a possible currency union within the EMEAP8, but they are not developed well enough to match the empirical findings.

The authors provide three main conclusions in the paper. First, using data constructed by Lane and Milesi-Ferretti (2006) and other empirical analyses, the authors argue that the EMEAP8 economies have experienced rising trends of global financial integration, but the degree of integration remains limited compared with the euro area. Second, they claim that, again compared with the euro area, the EMEAP8 economies are more integrated with global financial markets than with each other, that is, the degree of regional financial integration is much more limited. In obtaining the first and second conclusions, they note high saving-investment correlations, low fractions of idiosyncratic shocks to output that are smoothed by cross-country holdings of financial assets, and low degrees of cross-country risk sharing, for the EMEAP8. Finally, the authors state that a currency union is not feasible due to the presence of country-specific, idiosyncratic shocks to output that cannot be diversified or smoothed.

II. Assessments of the Three Main Conclusions

Let me take up these conclusions one by one. First, I agree in principle that the EMEAP8 economies' global financial integration is limited, particularly when compared with the degree of the euro area's global financial integration, but shows rising trends over time. If the Feldstein-Horioka (1980) measure is of any guidance, the saving-investment correlations are higher for the EMEAP8 economies than for the euro area countries, but they are declining over time, indicating a rising trend of financial openness. Based on the methodology of Kim, Kim, and Wang (2006), fractions of idiosyncratic shocks to GDP that are smoothed by international holdings of financial assets (measured by the coefficient g_k) are found to be lower for the EMEAP8 economies, albeit statistically insignificant, than for the euro area, but they are rising again over time, having reached the 0.3–0.4 range in recent years according to Figure 17 of the present paper. Using the Ravallion and Chaudhuri (1997) method, risk sharing through temporal, cross-country smoothing (measured by the coefficient α) is small in comparison to the euro area, but rising over time since the 1970s. Essentially, the authors convincingly establish the case that the degree of integration of the EMEAP8 with the global financial market is limited in comparison to the euro area but exhibits a rising trend over time.

Nonetheless, some results observed in Figures 13 through 15 are puzzling and may require the authors to address the sample size issue. I am not going to get into details but, for example, Figure 15 exhibits a negative correlation between financial

globalization and consumption volatility for the EMEAP8 as predicted by theory (that is, the more integrated with the global financial market, the less volatile is consumption), while the authors claim that the exclusion of Hong Kong and Singapore, two financially open economies, reduces the negative correlation, which is a puzzle. Perhaps the sample size of eight or six is too small to draw meaningful results, and the authors are encouraged to take a look at a larger number of emerging market economies, not only from East Asia but also from other regions of the world such as South Asia, Latin America, and Eastern Europe. More generally, other parts of the paper use data for the EMEAP8 and major OECD countries, rather than a wider set of emerging market economies. A more suitable analysis would be to assess the financial openness of the EMEAP8 in a larger set of emerging market economies by increasing the sample size.

Second, I would like to discuss the issue of global versus regional financial integration for the EMEAP8 economies. The authors' claim that the economies of East Asia are more integrated with global financial markets than with each other's financial markets is probably correct, but I do not think they have clearly established this claim. Looking at cross-border portfolio investment data (Table 1), for example, we find that the share of East Asia's portfolio investment in East Asia is only 5.7 percent of the region's total portfolio investment outflows, while East Asians invest heavily in Europe

Table 1 Cross-Border Portfolio Investment Flows, 2004

US$ billions, percentage of the total

Investment from:	Investment to:				
	NAFTA	EU-15	East Asia	Rest of the world	World total
Total portfolio investment					
NAFTA	624 (15.0)	1,866 (45.0)	588 (14.2)	1,070 (25.8)	4,149 (100.0)
EU-15	2,117 (17.6)	7,709 (64.1)	578 (4.8)	1,622 (13.5)	12,026 (100.0)
East Asia	849 (32.3)	944 (35.9)	149 (5.7)	688 (26.2)	2,630 (100.0)
Rest of the world	1,877 (42.2)	1,733 (39.0)	182 (4.1)	650 (14.6)	4,443 (100.0)
World total	5,468 (23.5)	12,252 (52.7)	1,497 (6.4)	4,031 (17.3)	23,247 (100.0)
Long-term debt securities investment					
NAFTA	218 (21.0)	438 (42.2)	62 (6.0)	319 (30.8)	1,037 (100.0)
EU-15	1,035 (14.8)	4,789 (68.4)	132 (1.9)	1,050 (15.0)	7,007 (100.0)
East Asia	615 (32.8)	718 (38.3)	49 (2.6)	492 (26.2)	1,875 (100.0)
Rest of the world	1,297 (46.9)	1,036 (37.5)	64 (2.3)	368 (13.3)	2,765 (100.0)
World total	3,165 (25.0)	6,981 (55.0)	308 (2.4)	2,229 (17.6)	12,683 (100.0)
Equity securities investment					
NAFTA	389 (13.5)	1,253 (43.5)	523 (18.1)	718 (24.9)	2,882 (100.0)
EU-15	914 (21.6)	2,348 (55.5)	402 (9.5)	569 (13.4)	4,233 (100.0)
East Asia	212 (33.5)	179 (28.2)	78 (12.3)	164 (25.9)	632 (100.0)
Rest of the world	237 (24.5)	415 (42.9)	48 (5.0)	267 (27.6)	967 (100.0)
World total	1,752 (20.1)	4,194 (48.1)	1,051 (12.1)	1,718 (19.7)	8,715 (100.0)

Note: NAFTA = North American Free Trade Area.
     EU-15 = European Union 15 countries.
     East Asia = Japan, Korea, China, Hong Kong, Singapore, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam.

Source: International Monetary Fund, *Coordinated Portfolio Investment Survey*, December, 2004.

(35.9 percent) and North America (32.3 percent). This is in sharp contrast to the EU-15's intra-regional investment share of 64.1 percent. This finding supports the view that, in terms of quantity, East Asia is more integrated with the global (U.S. and EU) financial markets than with its own region's financial markets. The limited intra-regional financial linkage within East Asia may be due to (1) the varying degrees of financial market openness and capital account liberalization among the EMEAP8 and (2) the region's weak financial systems. Although Hong Kong and Singapore have open, free markets, China still imposes tight capital and exchange controls, and many middle-income ASEAN countries also retain several cross-border impediments to capital flows and financial services. In addition, the weak and underdeveloped financial market infrastructure in many EMEAP8 economies may be forcing the region's investors to allocate their portfolio assets in more financially mature, developed markets like New York and London. I believe these are the fundamental reasons for East Asia's weak regional financial integration and its strong linkage with global financial centers.

I would like to encourage the authors to carry out additional study on regional financial integration. I would suggest, for example, that the authors expand the Ravallion and Chaudhuri (1997) analysis by adding the average of non-EMEAP8 economies' GDPs (like OECD countries' total GDPs) to the right-hand side of equation (4). This would allow them to examine whether consumption growth of the EMEAP8 can be better explained by GDP growth of the region alone or by global GDP growth in addition to regional GDP growth. If the non-EMEAP8 GDP growth has substantial explanatory power in the expanded equation (4), then this could be indirect evidence of the region's global portfolio diversification. On the other hand, if EMEAP8 GDP growth adequately explains national consumption growth, then regional financial integration is sufficiently strong.

Third, the authors state that "it is unlikely that a currency union in Asia is a feasible solution because a currency union takes away an important adjustment [namely, exchange rate adjustment] mechanism against idiosyncratic shock" (the brackets are mine). This statement is quite obvious, at least for now, but I think the issue is of a time dimension and country coverage. I agree that a currency union is infeasible for the entire EMEAP8 at this point, but what about the direction in which EMEAP (or more generally East Asia) is heading, and how about the scope of country coverage when discussing a currency union? Key questions include: is regional financial integration deepening or not? Can we identify a group of economies, where shocks are largely symmetric and can be reasonably absorbed with a common monetary policy—in other words, where optimum currency area (OCA) criteria can be applied? My view is that regional financial integration is deepening over time, which would eventually require some form of monetary and financial cooperation in the region. One may be able to identify a group of economies where even today conditions exist for a currency union. See the next section for such discussions.

III. Regional Financial Integration and Exchange Rate Policy

Let me quickly go over the issue of regional financial integration in East Asia. I agree that it is still limited, but there are signs that regional financial integration is progressing in East Asia. Cross-market differentials in interest rates are declining over time, cross-market co-movements in bond yields are increasing, and correlations of stock returns among the East Asian economies are rising. An important consequence of the growing regional financial—albeit limited—linkage is the heightened macroeconomic interdependence and business cycle co-movements within East Asia. That is, East Asian business cycles have become increasingly synchronized. Table 2 summarizes the results of an earlier study by Kawai and Motonishi (2005). The data demonstrate that the real activity variables (growth rates of real GDP, personal consumption, and fixed investment) are highly correlated among major economies in East Asia, notably Japan, Asian NIEs (Korea; Taipei,China; Hong Kong; and Singapore), and the middle-income ASEAN countries (such as Malaysia and Thailand). However, real activity variables of China and low-income ASEAN countries are not highly correlated with those of other East Asian economies, perhaps reflecting their limited financial openness and linkage with other economies in the region. Furthermore and surprisingly, emerging East Asia's real activity variables tend to be less correlated with those of the United States, the EU, Australia, and India. Rana (2006) provides rolling 10-year correlations of GDP growth for individual economies with ASEAN+3 (excluding the respective reference economy) growth as a whole.

Table 2 Correlation Coefficients between First Principal Component Scores for East Asia and Individual Economy Data, 1980–2002

Countries/ regions	Real GDP	Real consumption	Real investment	Real stock price	Real effective exchange rate	GDP deflator	Consumer price index	Wholesale price index
United States	0.01	−0.32	−0.41	0.36	0.48	0.17	0.85	0.30
EU-15	0.01	−0.18	−0.14	0.33	−0.33	0.10	0.78	−0.01
Australia	−0.16	−0.15	−0.20	0.33	0.67	−0.02	0.31	0.00
New Zealand	0.27	−0.04	0.19	0.11	0.27	−0.07	0.40	0.22
India	0.09	0.01	−0.03	0.10	0.40	0.06	0.63	0.34
Japan	0.58	0.39	0.41	0.71	−0.26	0.15	0.90	0.46
Korea	0.71	0.78	0.67	0.86	0.70	0.27	0.89	0.48
China	0.07	−0.14	−0.26	—	0.43	−0.40	0.15	—
Taipei,China	0.51	0.28	0.28	0.71	0.72	0.35	0.85	0.50
Hong Kong	0.74	0.63	0.58	—	0.48	−0.06	0.80	—
Singapore	0.77	0.76	0.59	—	0.77	0.08	0.87	0.45
Malaysia	0.90	0.87	0.95	—	0.81	0.40	0.79	0.68
Thailand	0.89	0.92	0.88	—	0.80	0.54	0.87	0.70
Philippines	0.33	0.31	0.55	0.91	0.81	−0.06	0.57	0.27
Indonesia	0.89	0.65	0.89	—	0.86	0.99	0.21	0.92

Notes: 1. The figures are correlation coefficients between the first principal component scores for East Asia and the original, log first-differenced series of individual countries.
2. In this analysis, East Asia includes Japan; Korea; China; Taipei,China; Hong Kong; Singapore; Malaysia; Thailand; the Philippines; and Indonesia.

Source: Adapted from Kawai and Motonishi (2005, table 5).

These correlations, reported for 1989–2003 (end-dated), have been uniformly higher from 1998 onward than before, although their levels for China tend to be lower than those of most other ASEAN+3 countries. By contrast, the growth rate correlations of ASEAN+3 with the United States and Europe have been progressively lower, becoming negative in the moving correlations from 1998 to 2003.

Essentially, the U.S. and European business cycles are not strongly correlated with those of East Asia. One interpretation for this result is that major East Asian economies—including Japan and its emerging neighbors apart from China and low-income ASEAN countries—are subject to common supply shocks, which are different from shocks hitting the United States or the EU. This tendency of growing macroeconomic interdependence among major East Asian economies will continue, and I expect countries like China and Vietnam will start showing such interdependence as they further open up their financial markets to the rest of the world. Thus, conditions supporting a common monetary policy and a currency union will grow, particularly among financially connected economies. A group of economies that are already sufficiently integrated in East Asia—such as Japan and Korea; or China, Hong Kong, and Macao; or Singapore, Malaysia, and Brunei Darussalam—may even today find it possible to initiate a subregional currency stabilization scheme if political consensus exists.

One of the reasonable policy implications is for the East Asian economies to begin exploring ways and means to introduce a subregional or regional mechanism to achieve intra-regional exchange rate stability (see Kawai [2007]). One such option would be to start taking steps to prepare for the possible creation of a regional, cooperative system similar to the Snake or Exchange Rate Mechanism (ERM) in Europe. Given that economic (particularly structural) convergence among the East Asian economies is not sufficiently advanced and that political relationships are not sufficiently mature to support the launch of a tightly coordinated regional system, a practical way of proceeding is to take a multi-track, multi-speed approach, whereby economies ready for deeper policy coordination begin the process while others prepare to join later. Each subregional group would intensify monetary and exchange rate policy coordination while allowing the possibility for others to join them subsequently or, over time, for these subregional groups to start negotiations to integrate into a larger monetary zone.

Apart from such a medium-term system design issue, East Asia faces immediate policy challenges. Macroeconomic management is becoming increasingly complex in an interdependent region, including the choice of exchange rate regime, the sequencing of capital account liberalization—for those economies that have yet to fully open their capital accounts—and policies to address global payments imbalances and surges in capital inflows. As the East Asian economies are increasingly integrated through trade and foreign direct investment and through finance—though financial integration is still limited—there will be an urgent need for some type of exchange rate coordination to ensure a certain degree of intra-regional rate stability. Given that East Asian exchange rate regimes are in serious disarray, the first step would be coordination of exchange rate regimes—toward greater exchange rate flexibility *vis-à-vis* the U.S. dollar. China's renminbi revaluation in July 2005 and the subsequent gradual appreciation of the currency against the dollar suggest the beginning of such coordination. The next

step is coordination of exchange rate policies to ensure some degree of intra-regional exchange rate stability. For example, the disorderly unwinding of global payment imbalances and/or sudden surges in capital inflows to East Asia would require coordinated action to jointly adjust the East Asian exchange rates so as not to alter drastically the intra-regional price competitiveness. The point here is that in the event of severe upward pressure on currency values in East Asia, regional exchange rate coordination will be necessary to engineer collective appreciation—which is possible through greater rate flexibility against the dollar and relative intra-regional stability of the currencies within the region—to minimize the adjustment costs for East Asia. This would require further exchange rate flexibility of the renminbi, whose movements tend to constrain the exchange rate policies of many other emerging economies in the region.

IV. Conclusion

Let me conclude by way of summarizing my comments. I understand that the EMEAP is a very important group for the Bank of Japan, and the paper focuses on the EMEAP8. But East Asia is bigger than that, and an analysis including Japan; Taipei,China; and other regional economies would be important. In addition, increasing the sample size to cover many other emerging market economies—such as those in South Asia, Latin America, and Eastern Europe—would also be quite useful to make a more meaningful international comparison. Carrying out a deeper analysis of regional financial integration and macroeconomic interdependence is essential to the discussion of the exchange rate regime, including currency union, in East Asia. The region needs to consider exchange rate policy coordination as an important policy option in the event of disorderly unwinding of global payments imbalances and/or massive, simultaneous inflows of capital to East Asia.

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General Discussion

Hiroshi Fujiki responded first to Shaghil Ahmed's (Board of Governors of the Federal Reserve System) comments by reiterating that the paper finds an increased benefit in terms of risk sharing arising from progress in financial integration in the Executives' Meeting of East Asia-Pacific Central Banks (EMEAP) 8 economies. He then acknowledged the importance of further decomposition of capital flows in measuring the degree of financial integration, particularly when countries such as China record different types of flows between assets and liabilities. He also agreed that understanding common shocks to the Asian economies was important.

Fujiki then turned to Masahiro Kawai's (Asian Development Bank Institute) comments by saying that the seemingly increasing financial integration with the rising α and g_k coefficients may not be very robust, and that this was a reason not to emphasize the particular result. He argued that one of the main conclusions—the region may not yet be ready for currency union—was based solely on the empirical evidence that the paper reports and the relevance of the currency union remains an open issue for the future.

In response to Kawai's suggestion to include other emerging economies, Akiko Terada-Hagiwara suggested that the inclusion of other economies should not affect the main message of the paper—that global factors play a major role and intra-regional integration was still limited.

In the general discussion, questions and comments were focused on the issues of interpretation of the results in the paper, measurement of financial integration, and the analytical framework for assessment of risk sharing. Regarding the interpretation of the results, Enrique Alberola Ila (Banco de España) and Jong-Wha Lee (Asian Development Bank) raised the issue of a possible endogeneity problem—the creation of a currency union promotes financial integration. Fujiki agreed with the comments, arguing that financial integration alone was not a sufficient condition for the introduction of a currency union.

In interpreting the falling correlation between saving and investment in the EMEAP8 economies, Michael Devereux (University of British Columbia) emphasized the critical role of current account reversals during the Asian financial crisis. Akira Ariyoshi (International Monetary Fund) wondered whether it may be official intervention and the accumulation of international reserves rather than "financial integration" that allowed countries to run increasingly large current account surpluses and thus caused the observed fall in saving and investment correlation. Made Sukada (Bank Indonesia) argued that the decreasing trend in the investment ratio in the EMEAP8 economies may not be due to the weak banking system, since substantial reform efforts have been made since the Asian financial crisis.

On issues related to measuring financial integration, a number of comments were received regarding the importance of the price measure and the divergence in *de jure* and *de facto* measures. Hans Genberg (Hong Kong Monetary Authority) and Már Gudmundsson (Bank for International Settlements) suggested that in measuring financial integration price measures might be more appropriate than the quantitative measure. Genberg added that the divergence in offshore and onshore interest rates in

China, for example, implies a lack of integration. Leonardo Bartolini (Federal Reserve Bank of New York) cast doubt on the widely accepted choice of the *de facto* over the *de jure* measure when the two differ. On this issue, Maurice Obstfeld (University of California at Berkeley) said that the two measures are complementary, and should be looked at simultaneously. Fujiki responded to these comments by referring to other studies on the price measure cited in the paper. Additionally, Bartolini argued that measures of financial integration are influenced by the extent to which countries are exposed to synchronized shocks, as also pointed out by Gudmundsson. Sukada said, by providing details of development in the capital account regulation, the reversal in the capital account openness as shown by the *de jure* measure in Fujiki and Terada-Hagiwara's paper may not be because of Indonesia.

On the analysis of risk sharing, some argued that solely looking at idiosyncratic shocks may not be appropriate in the region. Sanghoon Ahn (Korea Development Institute) discussed the unique characteristics of the vertical production chain in Asian economies that may have an implication for risk sharing. Anton Braun (University of Tokyo) argued that the type of risk-sharing schemes that Asian economies have opted for following the Asian financial crisis was their accumulation of international reserves, which may dominate other types of risk sharing over idiosyncratic shocks. In a reply, Fujiki agreed with the importance of these aggregate shocks to the region.

Another line of discussion concerned the extent of risk sharing that should be expected. As observed during the Asian financial crisis, Braun emphasized a role for private contract enforcement, which should constrain the extent of risk sharing. In this regard, Mark Spiegel (Federal Reserve Bank of San Francisco) suggested looking at Latin American economies rather than euro area economies as a benchmark against EMEAP, as they are more similar in terms of the stage of development. Alternatively, Devereux argued that under an incomplete market setup, the timeliness of the data matters. Consumption correlations across countries at low frequencies would be much higher, suggesting higher risk sharing, than those at very high frequencies. Fujiki said that the issues raised here remain for future research. Finally, Obstfeld opened a question for further discussion on why economists are seeing increasing financial integration in emerging markets generally, including East Asia, despite the shaky empirical evidence of its benefits.