

World Economic and Financial Surveys

Regional Economic Outlook

Asia and Pacific

Managing the Next Phase of Growth

APR 11



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Definitions

In this *Regional Economic Outlook: Asia and Pacific*, the following groupings are employed:

- “Emerging Asia” refers to China, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore, Taiwan Province of China, Thailand, and Vietnam.
- “Industrial Asia” refers to Australia, Japan, and New Zealand.
- “Asia” refers to emerging Asia plus industrial Asia.
- “Newly industrialized economies” (NIEs) refers to Hong Kong SAR, Korea, Singapore, and Taiwan Province of China.
- “ASEAN-4” refers to Indonesia, Malaysia, the Philippines, and Thailand.
- “ASEAN-5” refers to Indonesia, Malaysia, the Philippines, Thailand, and Vietnam.
- “E.U.” refers to the European Union
- “G-2” refers to the euro area and the United States.
- “G-7” refers to Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.
- “G-20” refers to Argentina, Australia, Brazil, Canada, China, the European Union, France, Germany, India, Indonesia, Italy, Japan, Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, the United Kingdom, and the United States.

The following abbreviations are used:

AIO	Asian input output
AREAER	Annual Report on Exchange Arrangements and Exchange Restrictions
ASEAN	Association of Southeast Asian Nations
BEC	Broad Economic Categories
BIS	Bank for International Settlements
CPI	consumer price index
CSD	Central Securities Depositories
DSGE model	Dynamic Stochastic General Equilibrium model
ETF	exchange-traded fund
FDI	foreign direct investment
G-20 MAP	G-20 Mutual Assessment Process
GDFM	Global Dynamic Factor Model
GDP	gross domestic product
GEM	Global Economic Model
GMM	generalized method of moments
GTAP	Global Trade Analysis Project
IEER	integrated effective exchange rate

DEFINITIONS

IPO	initial public offering
J-REIT	Japanese real estate trust funds
JETRO	Japan External Trade Organization
JGB	Japanese government bonds
LICs	low-income countries
MSCI	Morgan Stanley Capital International
NIE	newly industrialized economy
NPL	nonperforming loan
OECD	Organisation for Economic Cooperation and Development
P/E	price-earnings
PICs	Pacific Island countries
PMI	purchasing managers' index
REER	real effective exchange rate
REIT	real estate investment trusts
SAAR	seasonally adjusted at an annual rate
SBI	Bank Indonesia Certificate
SITC	Standard International Trade Classification
SMEs	small and medium-sized enterprises
SVAR	Structural Vector Autoregression
TOPIX	Tokyo stock price index
VAR	vector autoregression
VAT	value-added tax
VIX	Chicago Board Options Exchange market volatility index
VZIRP	virtually zero interest rate policy
WEO	<i>World Economic Outlook</i>

The following conventions are used:

- In tables, a blank cell indicates “not applicable,” ellipsis points (. . .) indicate “not available,” and 0 or 0.0 indicates “zero” or “negligible.” Minor discrepancies between sums of constituent figures and totals are due to rounding.
- An en dash (–) between years or months (for example, 2007–08 or January–June) indicates the years or months covered, including the beginning and ending years or months; a slash or virgule (/) between years or months (for example, 2007/08) indicates a fiscal or financial year, as does the abbreviation FY (for example, FY2009).
- An em dash (—) indicates the figure is zero or less than half the final digit shown.
- “Billion” means a thousand million; “trillion” means a thousand billion.
- “Basis points” refer to hundredths of 1 percentage point (for example, 25 basis points are equivalent to $\frac{1}{4}$ of 1 percentage point).

As used in this report, the term “country” does not in all cases refer to a territorial entity that is a state as understood by international law and practice. As used here, the term also covers some territorial entities that are not states but for which statistical data are maintained on a separate and independent basis.

This *Regional Economic Outlook: Asia and Pacific* was prepared by a team coordinated by Vivek Arora and Roberto Cardarelli of the IMF’s Asia and Pacific Department, under the overall direction of Anoop Singh. Contributors included Ashvin Ahuja, Ravi Balakrishnan, Sergei Dodzin, Jonathan Dunn, Nan Geng, Sonali Jain-Chandra, W. Raphael Lam, Cheng Hoon Lim, Adil Mohommad, Sylwia Nowak, Ceyda Oner, Akira Otani, Sanjaya Panth, Alexander Pitt, Yan Sun, D. Filiz Unsal, Olaf Unteroberdoerster, Jade Vichyanond, Xiaoyong Wu, Yiqun Wu, and Jie Yang. Souvik Gupta provided research assistance; Kessia De Leo, Antoinette Kanyabutembo, and Lesa Yee provided production assistance. Joanne Blake and Martha Bonilla of the IMF’s External Relations Department edited the volume and coordinated its publication and release. This report is based on data available as of April 12, 2011 and includes comments from other departments and some Executive Directors.

Executive Summary

The earthquake-related tragedy in Japan in mid-March 2011 resulted in terrible losses of life and property. The early and decisive actions by the Japanese government and the Bank of Japan have helped to contain the initial damage from the earthquake, but its aftermath continues to cast a pall over the region and indeed the world. The relatively limited negative impact of the tragedy on Japanese production and regional spillovers to the rest of Asia masks the scale of the humanitarian disaster and damage to the country's infrastructure and capital stock.

Meanwhile, in Asia as a whole, the recovery has matured as both exports and domestic demand have fueled rapid economic growth, which reached 8.3 percent in 2010. Exports have benefited from the global investment cycle as well as strong final demand from emerging economies in both Asia and other regions. Domestic demand has also been robust, reflecting still-expansionary fiscal policies as well as growing private demand. Private demand has been broad-based across both investment and consumption. Investment is being driven by the need in many Asian countries to overcome capacity constraints and to build infrastructure. Consumption, meanwhile, is being propelled by rising employment, wages, and productivity.

Near-term prospects are favorable, with growth in the Asia and Pacific region projected to average nearly 7 percent in both 2011 and 2012. Growth is expected to be led by China and India, whose economies are presumed to expand by 9½ percent and 8 percent, respectively, in the next two years. Their growth will have important spillovers for other countries in the region (and the world), particularly through demand for commodities. In Australia, for example, growth is expected to pick up to 3 percent and 3½ percent, respectively, in 2011 and 2012, as emerging Asia's demand for commodities increases and as private investment in mining emerges as the main driver of growth.

Risks to the growth outlook are evenly balanced. The prospects for sustained global growth have strengthened in recent quarters as uncertainties over private domestic demand in advanced economies have lessened. Meanwhile, new downside risks have emerged such as the turmoil in the Middle East and North Africa region—which could disrupt global growth and inflation—and spillovers from the earthquake-related tragedy in Japan. Meanwhile, fiscal and financial vulnerabilities continue to cloud the outlook for advanced economies, which are important trading partners for Asia.

Asia's rapid growth is accompanied by the emergence of pockets of overheating across the region in both goods and asset prices. Asset price pressures are reflected in strong credit dynamics as well as in certain segments of property markets in a few economies. Headline consumer price index (CPI) inflation has accelerated since October 2010, owing mainly to higher commodity prices; these prices, however, are also spilling over into core inflation. Core inflation is being further driven by still-accommodative financial conditions across the region that owe in part to procyclical monetary policy stances. Interest rates remain below levels that are consistent with stable growth and low inflation and in many cases are still negative in real terms. Inflation is expected to increase further in 2011, before decelerating modestly in 2012 as global commodity prices stabilize and central banks across the region make further progress with tightening macroeconomic conditions.

The task of policy tightening has been complicated by capital inflows, which surged in the first three quarters of 2010. Policymakers have sometimes feared that higher policy rates could attract even more inflows. Inflows have generally moderated since October 2010, although they have still been extraordinarily

large in a few Asian economies and remain a key concern of policymakers. Capital is expected to continue flowing into Asia in 2011 and 2012, attracted by the region's strong growth prospects and fueled by abundant global liquidity and risk appetite. In this context, policymakers' concerns have shifted to the instability associated with potential capital flow volatility should these inflows come to a "sudden stop" or even reverse. Several economies have introduced macroprudential measures targeted at reducing the risk of overheating in asset prices, and of subsequent busts if capital flows reverse. Chapter II argues that although these measures have been helpful, they are best seen as complements and not as substitutes for macroeconomic policy adjustment.

Further monetary tightening is necessary in economies that face generalized inflation pressures. In addition to higher policy rates, exchange rate flexibility is a key line of defense against overheating pressures. Exchange rate appreciation would result in a tightening of monetary conditions and reduce the burden to be borne by higher policy rates. Several economies also have scope for more fiscal consolidation, which will help to expand the fiscal space that would allow governments to respond more effectively to future shocks.

Looking beyond the near-term macroeconomic policy challenges, Asia faces a need to strengthen the platform for sustained strong growth over the medium term. Such a platform would depend on reducing inequality; raising employment prospects, which would also guard against risks to social stability; and continued efforts to rebalance growth by strengthening private domestic demand. Intra-Asian exports are a growing source of demand for many Asian economies, including exports of intermediate inputs to China in the context of the Asian "supply chain," as Chapter III shows, but Asia is still reliant on demand from the rest of the world. In the absence of further measures to increase domestic demand, the region's external balances would reemerge as the global economy recovers and demand from advanced economies picks up. As discussed in Chapter IV, policymakers in many Asian LICs and Pacific Island economies will also face the challenge of managing the social impact of higher commodity prices, and of maintaining sound financial systems in the face of rising and volatile capital inflows.

I. ASIA AFTER THE RECOVERY: MANAGING THE NEXT PHASE

A. Maturing Recovery and Good Near-Term Growth Prospects

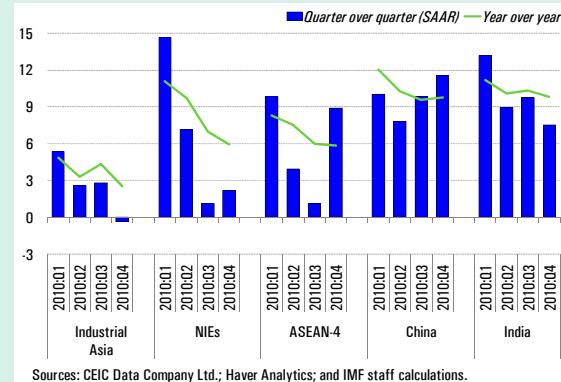
The Asia and Pacific region entered 2011 with healthy economic momentum (Figure 1.1). In late 2010, growth accelerated in ASEAN-4 economies, China, Hong Kong SAR, and Singapore, thanks to both domestic demand and exports, and remained robust in India and Korea. In Japan, a pickup in activity emerged in early 2011, but was interrupted in mid-March by the earthquake and tsunami that caused extensive loss of life and property. Spillovers to economic activity in the region through disruptions to Japan's role in regional trade and finance are expected to be manageable. Economic growth remained robust in Asian low-income and Pacific Island economies, as they benefited from strong commodity exports and investment in the mining sector (Lao P.D.R. and Mongolia), textile exports (Bangladesh), and tourism (Cambodia).

Asia's strong economic performance over the last few months reflects the renewed vigor of regional exports, which have accelerated in most of Asia (Figure 1.2). In particular:

- Asian exports have benefited from the global investment cycle. Although the global recovery has been relatively sluggish, investment in machinery and equipment by advanced economies has experienced a sharp turnaround. U.S. machinery and equipment investment, for example, has recovered much faster this time than after any of the recessions since the 1970s (Figure 1.3). Asia has taken special advantage of this cycle, thanks to the large share of machinery and transport equipment (about 60 percent) in

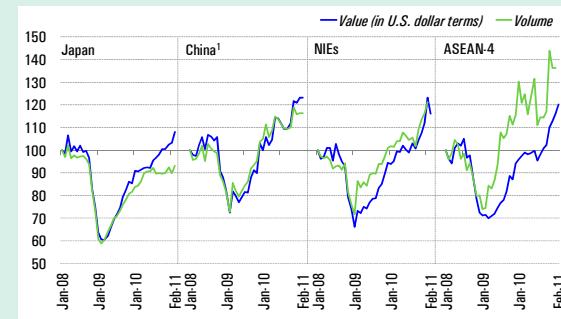
Note: The main author of this chapter is Roberto Cardarelli, with contributions from Stephan Danninger, Souvik Gupta, Adil Mohammad, D. Filiz Unsal, and Olaf Unterboerderster.

**Figure 1.1. Asia: Changes in Real GDP at Market Prices
(In percent)**



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

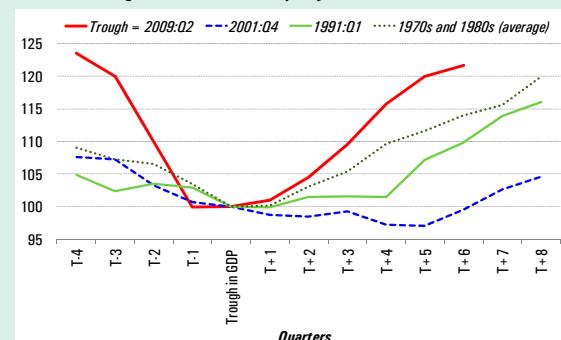
**Figure 1.2. Asia: Exports of Goods
(January 2008 = 100; seasonally adjusted)**



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

¹ The latest data represent average of January and February 2011 data for China to smooth out the effect of the lunar new year.

**Figure 1.3. United States: Real Private Fixed Investment in Equipment and Software during Business Cycle Recoveries
(Levels at trough = 100; seasonally adjusted)**



Sources: Haver Analytics; and IMF staff calculations.

REGIONAL ECONOMIC OUTLOOK: ASIA AND PACIFIC

overall regional exports, and the high import intensity of investment in advanced economies. Asian electronics exports have also benefited from long-term trends, such as the steady increase in the share of electronics in U.S. real personal consumption, notwithstanding the global recession.

- Asian exports have also been increasingly driven by greater final demand from emerging economies within and outside the region. In particular, rapid growth in the rest of Asia's exports to China reflects not only the recovery of trade in intermediate goods, but also the growing role of China as a source of final demand (Figure 1.4).



The strength in exports has boosted industrial production in Asia. Inventory-to-shipment ratios have declined since the third quarter of 2010 and, with leaner inventories, firms have reacted to strong sales by accelerating production (Figure 1.5). Helped by favorable weather and a strong run-up in prices, agricultural production also accelerated in late 2010 in many regional economies (particularly India and the Philippines).

At the same time, private domestic demand has also remained strong. Retail sales have continued to grow at double-digit rates in China and several ASEAN-5 economies, boosted by healthy consumer confidence and robust growth in real wages. Machinery and equipment investment has also

continued to recover as Asian firms step up capital spending to meet rising demand amid already high capacity utilization, and infrastructure investment remains strong in several economies (including Australia, China, and Hong Kong SAR).

Domestic demand in Asia has benefited from still-accommodative financial conditions and generally stimulative fiscal policies.

- Despite some monetary tightening in several economies, the real cost of capital remains well below both precrisis levels and historical averages and bank credit has continued to accelerate in the region (Figure 1.6). Corporate equity and debt issuance (local and external) increased strongly during 2010, especially in ASEAN-4 economies, China, India, and Korea, partly reflecting increasing risk appetite from foreign investors (Figure 1.7).
- Upward pressures on nominal exchange rates have abated slightly since October 2010. Following the March 2011 earthquake, the yen appreciated sharply but retreated after coordinated intervention by Japan and other G-7 countries. Overall, since October 2010, the yen has weakened in real effective terms owing to negative inflation (Figure 1.8). In nominal effective terms, exchange rates have also weakened somewhat since October 2010 in China, India, and the ASEAN-5 economies. In real effective terms, however, the weakening has been smaller, owing to high inflation in these economies, and the Indian rupee has actually appreciated. By contrast, nominal effective exchange rates have generally strengthened in Australia and New Zealand, owing to the continued rise in commodity prices, and in the newly industrialized economies (NIEs) (excluding Hong Kong SAR) owing to strong current account surpluses (and policy tightening in Singapore).
- At the same time, fiscal policy continued to be relatively expansionary in 2010 across the region. Only Hong Kong SAR, Korea, Malaysia,

and Vietnam have removed fiscal stimulus at an appreciable pace, as shown by a large negative fiscal impulse in these economies in 2010 (Figure 1.9).

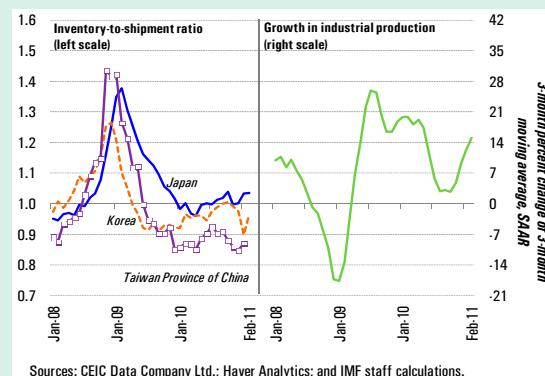
Despite strong employment growth, vulnerable employment and youth unemployment have remained high in many regional economies. The number of workers in vulnerable employment (unpaid family workers, casual workers, and own-account workers) grew considerably in Indonesia and Thailand in 2009 and only partially reversed in 2010. While overall unemployment edged down across the region in 2010, youth unemployment has generally remained flat at rates that, on average, are double the adult unemployment rates. Meanwhile, income inequality and social exclusion are still high in many Asian economies and are a concern for policymakers. The rapid globalization and urbanization that has fueled Asia's development has implied high returns for many workers but has also left behind others, particularly in lagging regions.

Economic growth in the Asia and Pacific region is expected to remain robust during 2011–12. On a sequential basis, growth is expected to accelerate gradually over the course of 2011, leading to annual growth for the region of nearly 7 percent in both 2011 and 2012 (Table 1.1), unchanged from the October 2010 *Regional Economic Outlook*. The pace of economic activity is expected to vary across the region. In particular:

- In Japan growth is expected to moderate from 3.9 percent in 2010 to 1.4 percent in 2011 and rise to 2.1 percent in 2012, as reconstruction spending partly offsets the negative impact of the disruption caused by the earthquake and tsunami. In Australia, growth is expected to accelerate from 2½ percent in 2010 to 3 percent and 3½ percent in 2011 and 2012, respectively, as the economy continues to benefit from emerging Asia's demand for commodities, and private investment in mining takes over from public demand as the main driver of growth. In New Zealand, growth is expected to slow down from 1½ percent in 2010 to about 1 percent in

Figure 1.5. Asia: Industrial Activity

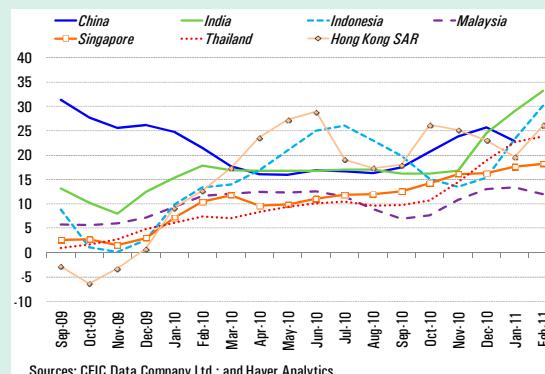
(Seasonally adjusted)



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

Figure 1.6. Selected Asia: Credit to Private Sector

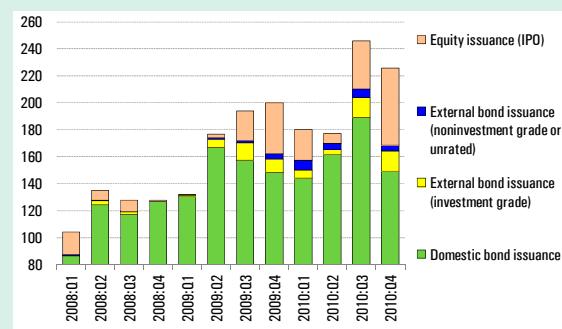
(3-month percent change of 3-month moving average; SAAR)



Sources: CEIC Data Company Ltd.; and Haver Analytics.

Figure 1.7. Emerging Asia: New Capital Raised by Corporations¹

(In billions of U.S. dollars)

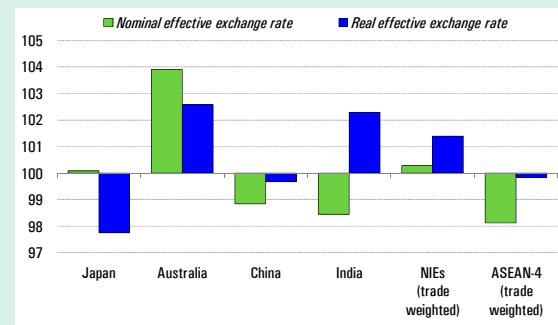


Sources: Asia Bonds Online; Bond Radar; and CEIC Data Company Ltd.

¹ Includes financial and nonfinancial corporations. Domestic corporate bond issuance does not include India.

REGIONAL ECONOMIC OUTLOOK: ASIA AND PACIFIC

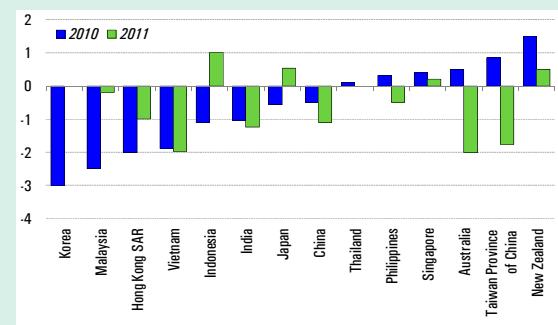
Figure 1.8. Selected Asia: Effective Exchange Rates¹
(Index; September 2010=100)



Source: IMF staff calculations.

¹ Increase relative to September 2010 indicates appreciation in effective exchange rate. Data as of March 2011.

Figure 1.9. Asia: Fiscal Impulse¹
(In percent of GDP)



Source: IMF staff estimates.

¹ Based on annual change (calendar year) in general government cyclically adjusted fiscal balance-to-GDP ratios. A negative number implies withdrawal of fiscal stimulus.

Table 1.1. Asia: Real GDP Growth
(Year-over-year; in percent)

	Actual data and latest projections		
	2010	2011	2012
Industrial Asia			
Japan	3.7	1.7	2.4
Australia	3.9	1.4	2.1
New Zealand	2.7	3.0	3.5
Emerging Asia			
NIEs	9.6	8.1	8.0
Hong Kong SAR	8.4	4.9	4.5
Korea	6.8	5.4	4.2
Singapore	6.1	4.5	4.2
Taiwan Province of China	14.5	5.2	4.4
China	10.8	5.4	5.2
India	10.3	9.6	9.5
ASEAN-5	10.4	8.2	7.8
Indonesia	6.9	5.4	5.7
Malaysia	6.1	6.2	6.5
Philippines	7.2	5.5	5.2
Thailand	7.3	5.0	5.0
Vietnam	7.8	4.0	4.5
Emerging Asia excl. China	6.8	6.3	6.8
Emerging Asia excl. China and India	8.8	6.5	6.3
Asia	7.7	5.2	5.1
	8.3	6.8	6.9

Source: IMF, WEO database.

2011, reflecting the impact of the earthquakes in September 2010 and February 2011. However, growth is expected to accelerate to 4 percent in 2012, as activity is supported by higher commodity prices, especially for dairy products, and by the post-earthquake reconstruction.

- In emerging Asia, GDP growth is projected at about 8 percent in 2011 and 2012. The projection is close to IMF staff estimates of potential output growth for the region, and only slightly below the 8½ average growth rate during the half-decade preceding the global financial crisis (2002–07). China and India are expected to lead the rest of the region. In China, growth is expected to moderate from 10½ percent in 2010 to 9½ percent in 2011–12, as policy tightening slows investment. In India, base effects and policy tightening are projected to slow growth from 10½ percent in 2010 to a more sustainable 8¼ percent in 2011 and 7¾ percent in 2012. In Indonesia, growth should accelerate from 6 percent in 2010 to 6¼ percent in 2011 and 6½ percent in 2012. Meanwhile, in other emerging Asian economies, growth in 2011–12 is projected to moderate from cyclical peaks in 2010 toward potential rates that are slightly lower than precrisis average growth.

Robust demand for consumer durables and the strong investment cycle projected in both advanced economies and emerging markets are likely to further boost Asian exports. As discussed in the April 2011 *World Economic Outlook*, the demand for consumer durables in advanced economies should continue to recover, as household saving rates stabilize, employment conditions gradually improve, and pent-up demand materializes. At the same time, strong corporate profits and balance sheets, as well as easy financial conditions, are expected to boost capital spending in advanced economies. U.S. investment, for example, is expected to expand to a solid 11½ percent pace (quarterly growth, year over year) on average over 2011–12. In addition, Asia is likely to benefit from the strong investment cycle projected in emerging and developing economies

(Figure 1.10). Commodity exporters, such as Australia, Indonesia, Malaysia, and New Zealand, are expected to gain from strong global and regional demand for food and energy (Box 1.1).

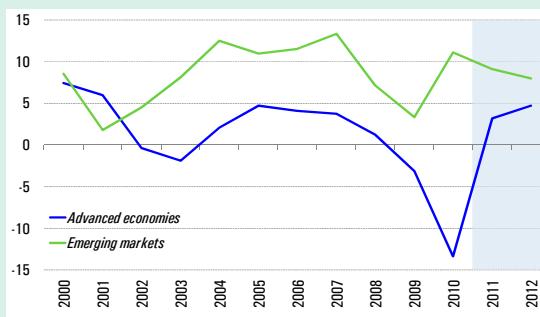
Private domestic demand should also remain robust in Asia. This reflects in part the buoyant export outlook as both investment and, to a lesser extent, consumption in Asia is closely correlated with export growth (Figure 1.11).

- *Investment:* The need to maintain and add to the capital stock is high in several regional economies, reflecting both cyclical and trend factors (Figure 1.12). Strong underlying demand has pushed firms close to capacity, especially in Korea, Indonesia, and the Philippines. Investment ratios in the region have yet to recover from their fall during the late 1990s and appear particularly low in the ASEAN-5 economies. An important component of the investment cycle is likely to involve building infrastructure in 2011 and beyond, particularly in ASEAN-5 economies, China, India, and—reflecting the reconstruction after the earthquake—in Japan.
- *Consumption:* private consumption in many regional economies will be supported by continued strength in employment and wages. Boosted by tight labor markets, strong productivity growth and, in a few cases (notably China, India, Indonesia, and Thailand), policy measures that boost household income, nominal wages are likely to continue to outpace inflation, offsetting the negative impact of higher prices on real disposable income and consumption. In Japan, however, sluggish labor markets and the lingering impact on sentiment from the earthquake are expected to remain a key headwind against stronger consumption.

Risks to the growth outlook appear to be more balanced now than they were in October 2010, although new downside risks have surfaced (Figure 1.13). As discussed in the April 2011 *World*

Figure 1.10. Global Investment¹

(Year-over-year percent change)

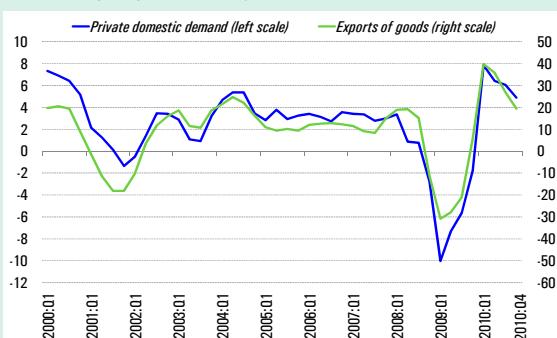


Source: IMF, WEO database.

¹ Advanced economies includes France, Germany, Italy, the United Kingdom, and the United States. Emerging markets include 36 economies from Africa, Asia, Europe, and Latin America.

Figure 1.11. Export-Oriented Asia: Private Domestic Demand and Exports¹

(Year-over-year percent change)

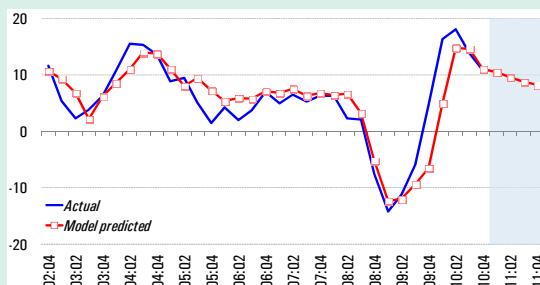


Sources: CEIC Data Company Ltd.; Haver Analytics; and IMF staff estimates.

¹ Export-oriented Asia includes the ASEAN-4 (excluding Indonesia), Japan, and the NIEs.

Figure 1.12. Selected Emerging Asia: Private Investment¹

(Year-over-year percent change)



Source: IMF staff estimates.

¹ Includes the ASEAN-4, Korea, and Taiwan Province of China. Based on a dynamic panel generalized method of moments (GMM) regression of investment growth on indicators of external demand, domestic demand, and financial conditions.

Box 1.1. Spillovers from Emerging Asia to Australia and New Zealand

The last decade has witnessed fast-growing trade integration between emerging Asia, and Australia and New Zealand. In 2010, almost 60 percent of Australia's exports—dominated by commodities—headed to emerging Asia, compared with 40 percent 10 years ago. At the same time, about half of Australia's imports came from emerging Asia, up from one-third a decade ago. New Zealand's exports to, and imports from, emerging Asia each have risen from about 20 percent of the total in 1990 to 30 percent and 40 percent, respectively, in 2010 (figure).

Australia has also benefited from emerging Asia's robust commodity demand and competitively priced manufacturing goods. In particular, urbanization and industrialization in China and India have boosted demand for commodities, especially iron ore and coal that account for one-third of Australia's exports. As a result, Australia has benefited from substantial terms-of-trade gains over the last decade, compared with commodity exporters in other regions (figure).

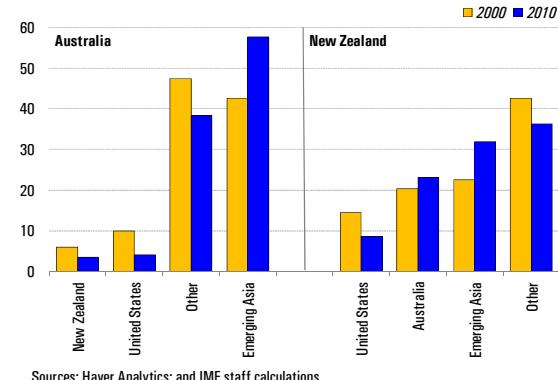
The growing integration with Asia and increasing dependence on commodity exports make growth in Australia and New Zealand more vulnerable to swings in commodity demand and prices. A structural vector autoregressive (VAR) approach can be used to assess these shocks.¹ The main results are as follows:

- During the last decade, shocks from emerging Asia have overtaken those from the United States as the most important external factor influencing Australia's business cycle. For the sample period 1991–2010, a 1 percent shock to U.S. GDP is found to move Australian growth by about 0.4 percent (figure). In contrast, GDP shocks from emerging Asia have an almost negligible impact on Australian growth. This result changes dramatically when limiting the sample period to 2000–10, for which a 1 percent shock to emerging Asia's growth is found to shift Australian growth by $\frac{1}{3}$ percent, whereas the impact of U.S. GDP shocks on Australia is no longer statistically significant.

Note: The main author of this box is Yan Sun.

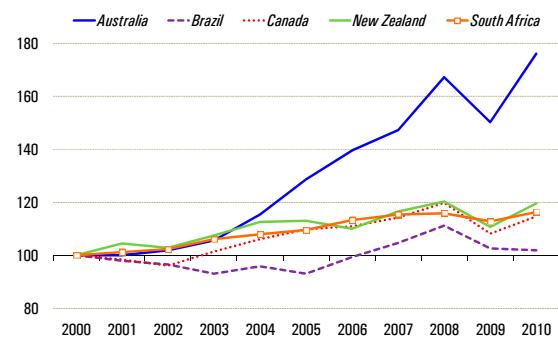
¹ Based on Sun (forthcoming).

Australia and New Zealand: Exports by Destination (In percent of total exports of goods)



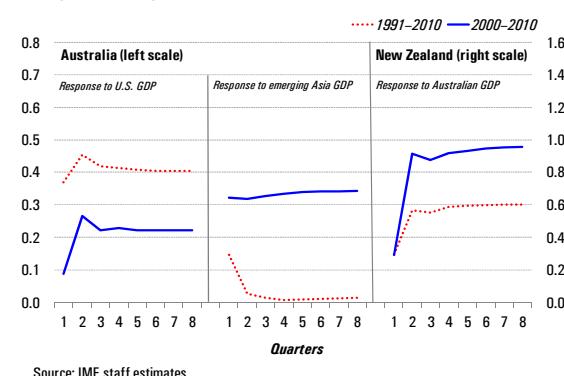
Sources: Haver Analytics; and IMF staff calculations.

Terms of Trade: Goods and Services (Index ; 2000 = 100)



Sources: IMF, WEO database and staff calculations.

Australia and New Zealand GDP: Accumulated Response to Shocks to Trading Partner GDP (In response to 1 percent shock)



Source: IMF staff estimates.

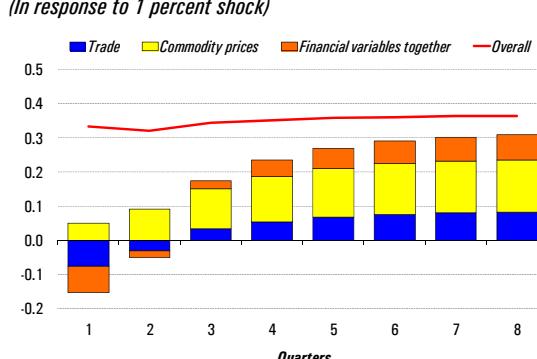
- Commodity prices dominate the transmission of shocks from emerging Asia to Australia. The three transmission channels identified in the model—trade, commodity prices, and financial variables (including interest rates and equity prices)—account for most of the estimated spillovers to Australia. In particular, commodity prices alone explain half of the spillovers from emerging Asia to Australia.
- New Zealand's business cycle is exposed to emerging Asia mostly through Australia, its single most important trade and financial partner. Shocks from emerging Asia are found to have a negligible direct impact on New Zealand. Rather, New Zealand's GDP is most responsive to shocks from Australia, and the responsiveness has strengthened to almost “one-to-one” during the last decade. IMF staff analysis also suggests that shocks from Australia to New Zealand have been transmitted mostly through financial variables, as the financial system of New Zealand is dominated by four subsidiaries of Australian parent banks.

The long-term trend of continued strong growth in emerging Asia bodes well for Australia. The IMF's Global Economy Model (GEM) can be used to assess emerging Asia's impact on Australian long-term growth prospects.² The model captures two main channels through which emerging Asia's growth can affect Australia: trade integration and terms-of-trade gains.

The simulation suggests that, should emerging Asia continue to grow notably faster than the world average, the impact on Australia will be even larger than in the past. This larger impact reflects both the increase in emerging Asia's economic size and Australia's growing integration with emerging Asia. Over the next 10 years, the model suggests that a 50 percent increase in emerging Asia's real GDP, driven by tradable sector productivity growth, would raise Australian GDP by about 20 percent (figure). However, should emerging Asia's economic growth become more balanced, with productivity growth in both tradable and nontradable sectors contributing equally, the growth dividend is roughly cut in half, owing to more modest improvements in the terms of trade of Australia.

Australia: Accumulated Response of GDP to Shocks to Emerging Asia GDP, 2000–10

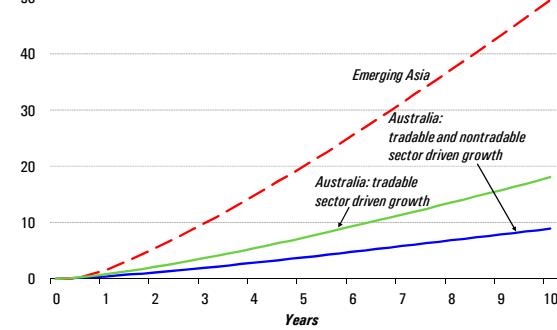
(In response to 1 percent shock)



Source: IMF staff estimates.

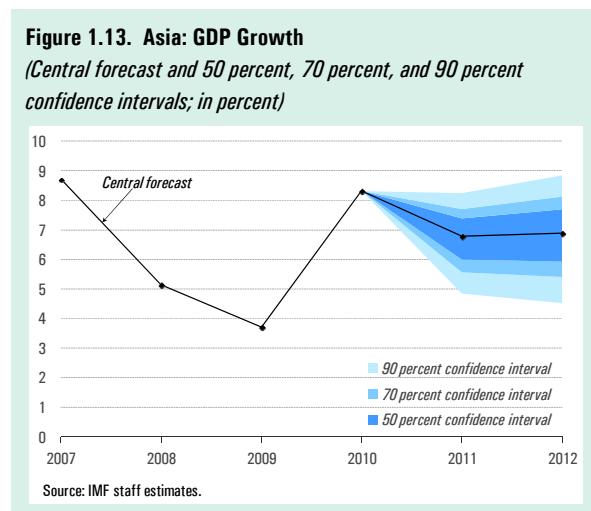
Impact of Emerging Asia's Growth on Australia's Growth (Percent deviation from baseline)

(Percent deviation from baseline)



Source: IMF staff estimates.

² Based on Hunt (2010).



Economic Outlook, the prospects for enduring global growth have increased, and uncertainty about the outlook has declined somewhat. Of particular importance for Asia, concerns about the sustainability of private domestic demand in advanced economies have moderated over recent months, and there are upside risks to Asia's export dynamics from a stronger recovery. On the other hand, new downside risks have arisen:

- The turmoil in the Middle East and North Africa region that started in February 2011, and the related risk of further spikes in oil prices, are intensifying concerns in many emerging economies and pose a risk to global growth. The direct impact of higher oil prices on growth is likely to vary across Asia, based on dependence on oil imports, but should remain relatively limited. IMF staff estimates that a further 40 percent increase in oil prices in 2011 relative to baseline forecasts in the April 2011 *World Economic Outlook* (to US\$150 per barrel) would shave between $\frac{1}{2}$ and $\frac{3}{4}$ percentage points off annual 2011 GDP growth in China, Japan, and the NIEs, while it would have a smaller negative impact (up to $\frac{1}{4}$ percentage points) in India and Indonesia, and marginally benefit GDP growth in Australia and Malaysia. However, Asian economies could be severely affected if second-round effects from higher oil prices resulted in a global slowdown, as they are highly dependent on external demand.

- There are also important downside risks to growth in Japan from supply disruptions and longer than foreseen electricity shortfalls related to the earthquake, which would have spillovers to the region. In particular, a prolonged disruption in production and transportation facilities would affect regional production networks by more than anticipated in our baseline. Moreover, the need to replace or at least supplement nuclear power (which represents about 30 percent of Japanese energy supply) with other energy sources, as well as the reconstruction efforts, could pose upward pressure on global commodity prices.

- The global environment is still complicated by significant fiscal and financial vulnerabilities in advanced economies. An escalation of financial tensions in the euro area would affect Asia mainly through the trade channel, as for many Asian economies export exposure to Europe is at least as large as that to the United States (Figure 1.14). IMF staff estimates suggest that the value added embedded in exports to Europe accounts for about 10 percent of total value added produced by the average Asian economy, with a much larger share in the more export-dependent economies (such as Malaysia, Singapore, and Thailand).

B. Pockets of Overheating Across the Region Pose New Risks to the Outlook

Meanwhile, new risks have emerged within Asia from potential overheating pressures in goods and asset markets. Although the magnitude and origin of these pressures vary across economies, they appear to be exacerbated by the procyclical macropolicy stances in the region. In a few cases (such as Indonesia and Korea), the rapid rebound of capital inflows after the global crisis has raised concerns about the impact on domestic financial markets. While these concerns have been somewhat mitigated by the slowdown of capital flows to Asia since late

2010, signs of overheating pressures from domestic imbalances have intensified.

In particular, headline inflation in Asia has accelerated since October 2010, mainly owing to higher commodity prices. For the region as a whole, headline CPI inflation accelerated to 4½ percent (year over year) in February 2011, from about 4¼ percent in October 2010. The degree of acceleration differs widely across Asia, partly reflecting different weights of food and energy prices in CPI indices, with India, Indonesia, and Vietnam (Box 1.2) experiencing relatively higher inflation (Figure 1.15). In Japan, deflation has moderated with the rise of commodity prices, but underlying inflation pressures and expectations remain subdued. In Australia, inflation eased from 3.1 percent in June to 2.7 percent in December 2010, following the appreciation of the Australian dollar. In New Zealand, headline inflation accelerated at end 2010 owing to higher food prices and the increase in goods and services tax rates. Still, spare capacity has helped contain inflation expectations within the 1–3 percent inflation target band.

It appears, however, that higher commodity prices are spilling over to a more generalized increase in inflation. Core inflation has accelerated by about ½ percentage point in the region as a whole since October 2010, and by even more in economies operating closer to full capacity (Hong Kong SAR, Singapore, and Vietnam). In many Asian economies, inflation expectations have accelerated since October 2010 (Figure 1.16) and indicators of cost pressures in the manufacturing sector have increased (Figure 1.17). In China, the underlying inflation momentum picked up at the end of 2010, reflecting the pass-through from higher food prices and strong growth in monetary aggregates (Box 1.3). In Hong Kong SAR, the acceleration of underlying inflation also reflects the strong increase in private housing prices and rentals.

Policymakers have tried to smooth the social implications of higher inflation with a range of measures. In several economies, policymakers have

Figure 1.14. Selected Asia: Exports of Goods to the United States and Europe

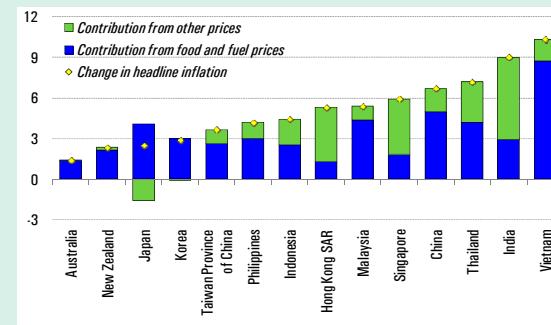
(In percent share of total exports of goods; as of 2010:Q4)



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

Figure 1.15. Asia: Changes in Headline Inflation since 2009¹

(In percentage points)

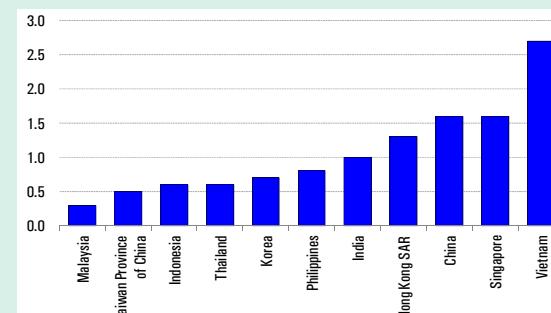


Sources: CEIC Data Company Ltd.; and IMF staff calculations.

¹ Difference between the latest available inflation rate (year over year) and the lowest inflation rate in 2009. Wholesale prices used for India.

Figure 1.16. Emerging Asia: Changes in Expectations of Annual 2011 Inflation since October 2010¹

(As of March 2011; in percentage points)



Sources: Consensus Economics Inc.; and IMF staff calculations.

¹ For India, change in expectations of average annual wholesale price inflation for fiscal year ending in March 2012.

Box 1.2. Vietnam: Restoring Macroeconomic Stability

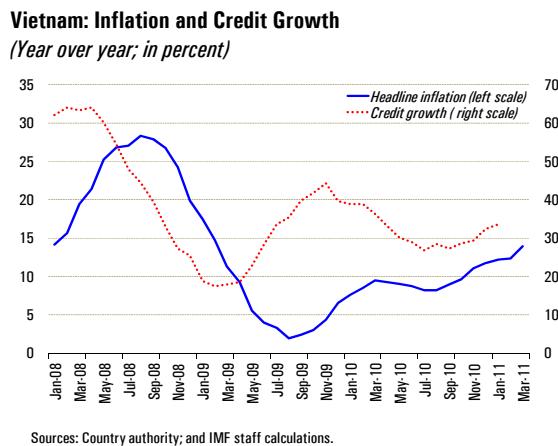
Vietnam has weathered the global crisis well, supported by a substantial fiscal stimulus package, amounting to 5 percent of GDP, and monetary policy easing.¹ Thanks to these measures, GDP still grew by 5.3 percent in 2009, despite the sharp decline in FDIs and external demand, making Vietnam one of the strongest performers in Asia. In 2010, growth accelerated to 6.8 percent, buoyed by strong domestic and external demand.

However, the expansionary policies adopted during the crisis have raised macroeconomic risks. Although most fiscal stimulus measures expired in late 2009, monetary policy has remained accommodative. Credit growth remained high in 2010, inflation increased sharply, and the exchange rate and international reserves came under pressure. Market confidence deteriorated, exacerbated by uncertainty over the authorities' policy intentions.

Pressures in Foreign Exchange Market

The Vietnamese dong stabilized after a 2 percent devaluation in August 2010. But the stabilization proved to be short lived, as it was not followed by monetary policy tightening, and the exchange rate came under renewed pressures in October 2010. The gap between the official and the implied market exchange rates widened to 10 percent, as demand for U.S. dollars surged. Apart from the seasonal increase of imports before the Tet holidays, the persistent pressure on the exchange rate reflected rising inflation and the erosion of confidence in Vietnam's external position.

- Inflation accelerated to 13.9 percent (year over year) in March, the highest level in the past 24 months and well above other ASEAN economies (figure). Core inflation (excluding food and fuel) rose to 9.8 percent (year over year). This reflected rising international food and commodity prices, a rapid pass-through to import prices of the weaker market exchange rate, and, more importantly, the strong expansion of bank credit by both regional standards and relative to Vietnam's per capita income.
- Despite a significantly narrower current account deficit (by nearly 3 percentage points) and strong net capital inflows in 2010, the overall balance of payments was driven into deficit by large unrecorded outflows, amounting to US\$13½ billion (12½ percent of GDP). These outflows were largely in the form of increased holdings by residents of foreign currency and gold outside the financial sector, and reflect their weak confidence in the Vietnamese dong and, more generally, the Vietnamese banking sector. In response, international reserves are estimated to have declined further to about 1.4 months of imports by end-2010.



The Policy Response and Outlook

To bring the official exchange rate more in line with the market exchange rate, the authorities devalued the Vietnamese dong by 8.5 percent in February 2011. While devaluation had been long anticipated by market

Note: The main authors of this box are Alexander Pitt and Jie Yang.

¹ The base (prime) rate was cut by a total of 700 basis points (bps) between October 2008 and February 2009. Meanwhile, liquidity was injected through open market operations as well as a much lower reserve requirement ratio on the Vietnamese dong.

participants, the scale was larger than expected. At the same time, the authorities narrowed the band from ± 3 percent to ± 1 percent, and indicated that, in future, the official rate would be set more flexibly and be more aligned with market rates (figure).

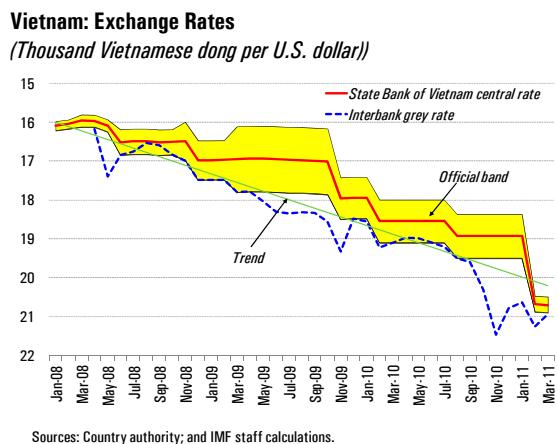
Subsequently, the authorities announced a series of measures to rein in inflation and increase the supply of foreign exchange to the financial system. At the core of the policy package is a tightening of monetary policy, which intends to reduce credit growth to below 20 percent, close to the projected growth rate of nominal output. Correspondingly, the authorities raised the refinance and discount rates on March 2011 and repo rate on April 2011. In

addition, in an effort to increase the supply of foreign exchange to the banking system, the authorities are planning to ban gold bar trading and reduce foreign exchange holdings of state-owned enterprises, and have requested banks to limit lending to nonpriority sectors. The authorities have also announced plans to contain public spending, targeting a faster reduction of the fiscal deficit in 2011. Markets have welcomed the policy package but await implementation. The parallel market rate initially depreciated somewhat from its predevaluation level on expectations of future devaluations, but has since recovered toward the lower end of the exchange rate band.

The outlook for 2011 depends critically on whether the new policy package will succeed in restoring policy credibility as well as domestic and foreign investor confidence. Decisive and sustained implementation is therefore critical to reduce inflation, build confidence, and strengthen the external position. In addition, the authorities should stand ready to tighten policies further if necessary. If sound macroeconomic policies are implemented, the outlook for 2011 is broadly favorable. Growth is projected at $6\frac{1}{4}$ percent, inflation is forecast to decline to $9\frac{1}{2}$ percent by the end of 2011, and reserves are projected to rise.

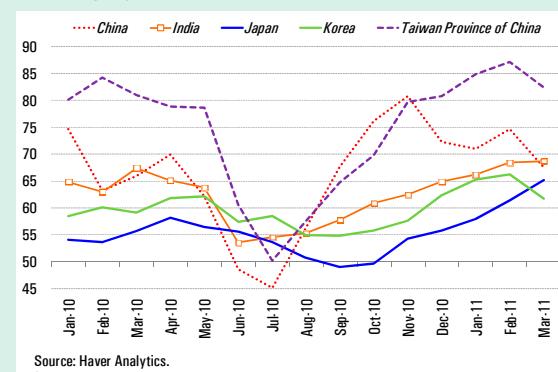
implemented a range of administrative measures to counter inflation. In Korea, a package of anti-inflation measures was announced in January 2011, including freezes on utility charges and tariff cuts. Similarly, Thailand delayed plans to remove subsidies on fuel and palm oil imports, and Indonesia reduced or eliminated tariffs on many food imports. In other economies (Singapore and Hong Kong SAR), one-off cash transfers and personal income tax rebates were announced to buffer household real incomes from inflation.

Headline inflation is generally expected to increase further in 2011, before decelerating modestly in 2012 (Figure 1.18). In 2011, global food and energy price inflation, projected in the April 2011 *World Economic Outlook* at 24 percent and 32 percent,



in addition, in an effort to increase the supply of foreign exchange to the banking system, the authorities are planning to ban gold bar trading and reduce foreign exchange holdings of state-owned enterprises, and have requested banks to limit lending to nonpriority sectors. The authorities have also announced plans to contain public spending, targeting a faster reduction of the fiscal deficit in 2011. Markets have welcomed the policy package but await implementation. The parallel market rate initially depreciated somewhat from its predevaluation level on expectations of future devaluations, but has since recovered toward the lower end of the exchange rate band.

Figure 1.17. Selected Asia: Purchasing Managers' Index (PMI)—Input Costs for Manufacturing Industries¹
(*Seasonally adjusted*)



respectively, will add to inflation pressures in the region. With output gaps estimated to have closed in

Box 1.3. Is China Overheating?

Consumer price inflation in China rose during the course of 2010, and reached 4.9 percent (year over year) in January and February 2011 (figure). On a 3-month sequential basis (seasonally adjusted, annualized), inflation surpassed 8 percent in December 2010 and January 2011. These price pressures were initially seen in raw food, but have begun to spread to other items, notably edible oil and food-related manufacturing and services, as well as housing costs. Even so, about 70 percent of year-over-year inflation is still being driven by food-related items.

The latest inflation expectation survey for urban areas shows that more than 60 percent of the population expects further price increases in the coming months, the highest proportion since 2008.

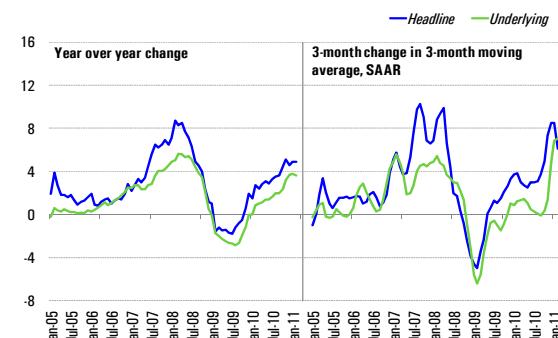
It is, however, premature to say that China is “overheating.” Inflation appears close to peaking, as food supply shocks begin to work themselves out of the system. There are few signs that wage increases are outpacing productivity gains—sequential growth of industrial unit labor cost is around zero and the latest household surveys suggest that wage incomes are still falling as a share of GDP.

To detect overheating, we construct a measure of “underlying” consumer price inflation that excludes both raw food items (which are volatile and dominated by supply disturbances) and administered prices (which tend to move little over time). This measure of inflation has the following properties: (i) it accounts for about one-half of the CPI basket; (ii) it tracks headline inflation well; and (iii) it should provide the clearest indicator of rising demand pressures. On this basis, underlying inflation picked up momentum in late 2010 and has continued to accelerate in 2011. The surge in underlying inflation seems to be a consequence of both a pass-through from the earlier pickup in raw food prices and an unusually strong sequential momentum in broad money (M2) growth during late 2010. Notably, underlying inflation appears to be more broad based now than it was during the inflationary episode in 2007 (figure).

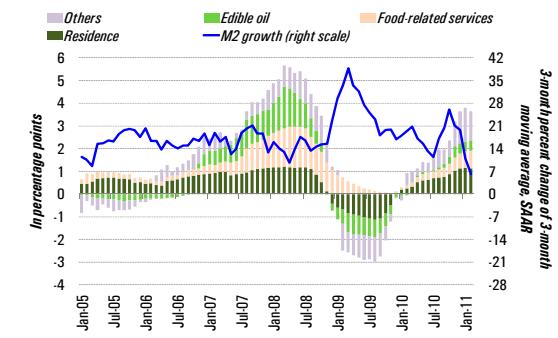
To identify the role of demand in inflation, a model is estimated that relates underlying inflation to M2, fixed asset investment, industrial value added, export demand, raw food price inflation, and world nonfuel commodity prices. The results suggest that shocks to underlying inflation tend to dissipate gradually over approximately 18 months (figure). Raw food prices tend to have a large and persistent pass-through to underlying inflation. Both demand (industrial value added) and monetary shocks affect inflation—Chinese inflation is not, as some would contend, “all food”—but it takes a large and persistent demand expansion to push underlying inflation above its trend. Indeed, price pressures are held down by the impact of China’s high levels of investment, which add quickly to supply capacity.

Note: The main authors of this box are Ashvin Ahuja and Nan Geng.

**China: Consumer Price Inflation
(In percent)**



China: Contributions to Underlying Inflation and Money Supply Growth¹



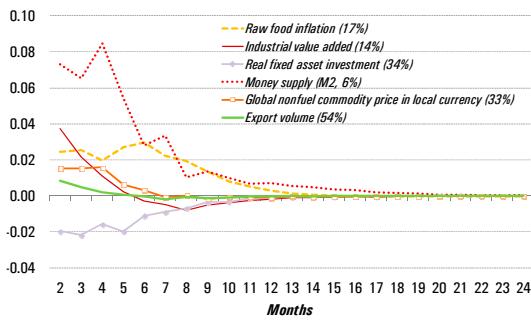
The estimated model can be used to forecast underlying inflation, assuming that industrial value added, fixed asset investment, export volume, and world nonfuel commodity price evolve in line with the current IMF *World Economic Outlook* forecasts; and that M2 grows by 16 percent, in line with the government's target for 2011. Under these assumptions, underlying inflation will peak during mid-2011 (at about 6–7 percent) as raw food inflation and the lagged effects from the 2010 monetary expansion pass through to prices. Underlying inflation will then fall to about 5 percent by end-2011 and continue its decline into 2012.

To summarize, the model indicates that demand factors are playing a role in driving China's inflation, but their impact is limited and will be short lived. The current episode of inflation does not look like a bout of generalized overheating with China's strong growth beginning to bump up against capacity constraints. Barring future supply shocks (either domestically or in global commodity markets), inflation in China is likely to return toward the low single digits in the second half of 2011. Nevertheless, the economy is still vulnerable to further domestic supply shocks and rising global commodity prices, particularly food. In this environment, it will be important therefore to maintain a prudent monetary stance to forestall the possibility that inflation may become more generalized and entrenched.

many economies by early 2011, demand pressures will also add to core inflation pressures. Inflation is projected by IMF staff to be above or close to the upper range of targets in Australia, India, Indonesia, Korea, the Philippines, and Thailand. In China, inflation is expected to return toward the low single digits in the second half of 2011, as the pass-through from higher food prices and strong monetary growth in late 2010 gradually dissipates. In 2012, the gradual stabilization of global commodity prices and projected further efforts to tighten monetary policy stances in the region should contribute to reduce inflation, which will, however, remain elevated in several economies (Figure 1.19).

Inflation risks remain on the upside. As noted in the April 2011 *World Economic Outlook*, low inventories and limited scope for supply to respond to higher demand mean that the forecasts for commodity prices are exposed to upside risks. Indeed, supply disruptions in the Middle East and the North Africa region could have a far-reaching impact on global oil prices. And concerns about food shortages could lead countries to impose export restrictions or induce speculative demand,

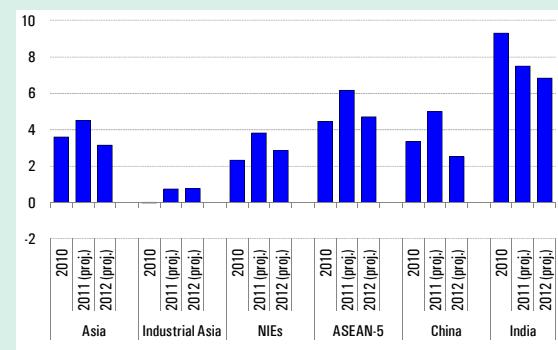
China: Impulse Response of Underlying Inflation to Shocks¹
(In percentage points; standard deviation of shocks in parentheses)



Source: IMF staff estimates.

¹ 3-month moving average of the responses to a 1 percent shock to each of the variables in the chart legend.

Figure 1.18. Asia: Consumer Prices¹
(Year-over-year percent change)



Sources: IMF, *WEO* database and staff projection.

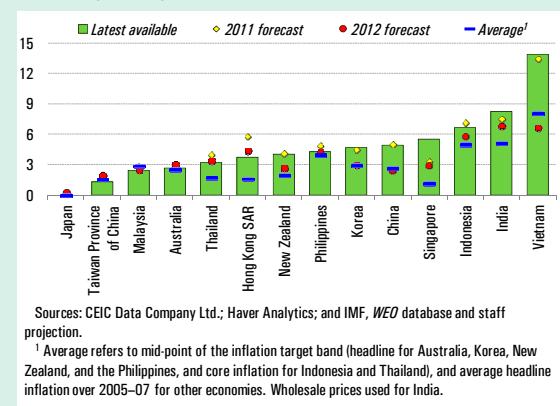
¹ Wholesale prices used for India.

causing an upward spiral in global prices. A stronger-than-expected increase of commodity prices is likely to affect headline inflation in Asia mainly through two channels:

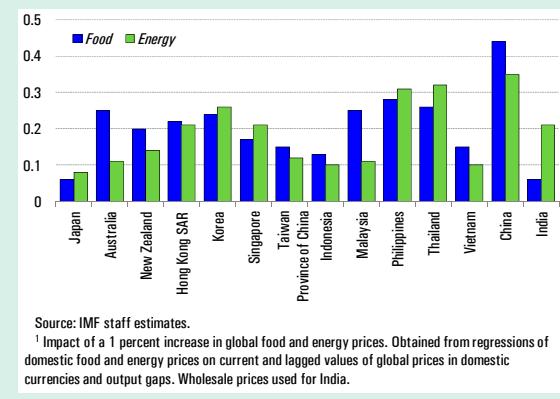
- *Direct impact on domestic food and energy prices.* Economies that import most of their food or energy, and that rely less on domestic price controls and subsidies, are likely to be more

REGIONAL ECONOMIC OUTLOOK: ASIA AND PACIFIC

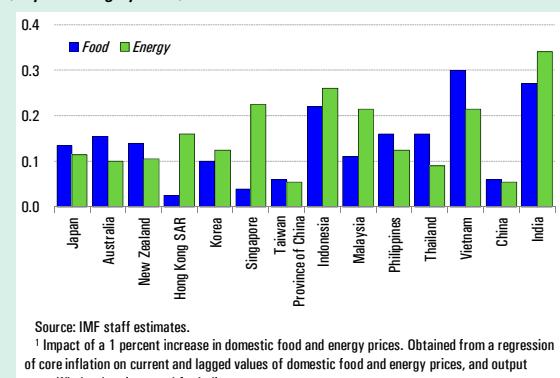
**Figure 1.19. Asia: Headline Consumer Price Inflation
(Year over year; in percent)**



**Figure 1.20. Asia: Pass-Through from Global Food and Energy Prices to Domestic Food and Energy Prices¹
(In percentage points)**



**Figure 1.21. Asia: Pass-Through from Domestic Food and Energy Prices to Core Inflation¹
(In percentage points)**



affected. Only one-fifth of the increase in global food and energy prices has been reflected in local prices on average across the region over the last decade, but the estimated pass-through has been generally higher in China, the Philippines, and Thailand. Higher global food prices have a more limited impact on India's food prices, which tend to respond more to domestic factors (Figure 1.20).

- *Spillovers to core inflation.* As shown in the October 2010 *Regional Economic Outlook*, changes in food and energy prices tend to have significant second-round effects on inflation in Asia, and these effects tend to be amplified when demand conditions are strong and firms have more pricing power. Although the pass-through from food prices to core inflation depends in part on the weight of food in expenditure baskets, the monetary policy framework (and particularly monetary authorities' ability to control inflation expectations) also plays a role. IMF staff estimates show that India and ASEAN-5 economies appear to have experienced a relatively high pass-through from food and energy prices to core inflation in the last decade (Figure 1.21).

Taking into account both the direct and indirect impact on inflation, a further 10 percent increase in global commodity prices in 2011 would lead to an additional 1 percent increase in headline inflation on average in the region (Figure 1.22). The impact would be larger in China, India, and the ASEAN-5 economies, whereas it would be smaller in industrial Asia and the NIEs.

There are also signs that overheating pressures are building up in a few regional asset markets. Although it is hard to identify bubbles, a comparison of some key indicators with their values at previous peaks or at the same stage of the cycle can shed some light on potential risks:

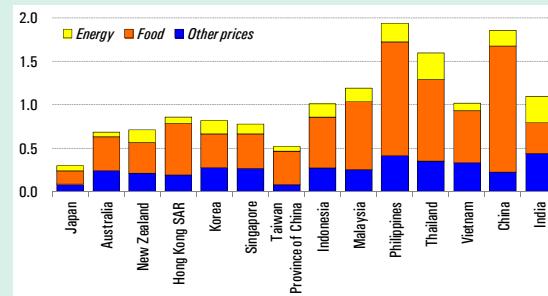
- *Credit dynamics* are particularly strong in China and Hong Kong SAR. In these economies, the

cyclical component of the credit-to-GDP ratio in early 2011 was about 1 and 1½ standard deviation above its historical average, respectively (Figure 1.23). In other economies (India, Indonesia, and Singapore) credit growth accelerated rapidly over the last 12 months. In most cases, this acceleration mainly reflects a pickup of credit to firms (India and Indonesia), but in a few economies (Singapore and Malaysia), it reflects credit to the household sector, in particular mortgages (Figure 1.24). In Hong Kong SAR, loans to the property sector contributed about one-half to the expansion of domestic credit in 2010, prompting the authorities to intervene to tighten mortgage underwriting standards. As a result, mortgage loan-to-value ratios have fallen to 58 percent, the lowest since 2000, and mortgage delinquencies are virtually nonexistent.

- *Property* markets appear relatively buoyant in certain segments in China, Hong Kong SAR, and Taiwan Province of China. Although real house price growth slowed down during 2010, price-to-rent ratios are still relatively high in China and Hong Kong SAR (more than 1½ standard deviations above historical averages). In Taiwan Province of China, real house price growth in late 2010 was faster than during previous cyclical peaks (Figure 1.25).
- There is less evidence that *equity* and *bond* valuations are out of the ordinary, especially after the moderation since early 2011. Equity valuations have moderated in China, India, and ASEAN-5 economies, possibly reflecting concerns that a further pickup of inflationary pressures may induce a stronger monetary policy tightening cycle (Figure 1.26). Bond prices have also generally weakened in the region, as financial markets are pricing in a steepening of the yield curve. In March 2011, forward-looking price-earnings ratios stood above historical averages only in China (Figure 1.27), and even then not abnormally so.

Figure 1.22. Asia: Impact of 10 Percent Increase in Commodity Prices on Headline Inflation¹

(In percentage points)

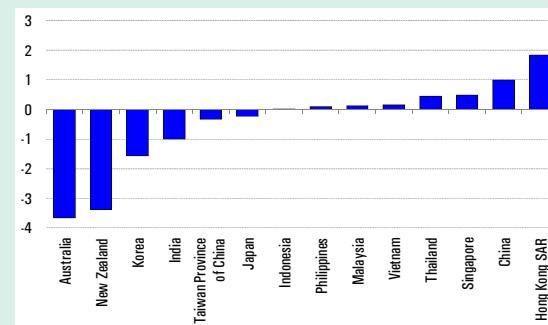


Source: IMF staff estimates.

¹ Calculated as the sum of the direct pass through from global food and energy prices to domestic food and energy prices, and pass through from domestic food and energy prices to core inflation (second-round effects). Wholesale prices used for India.

Figure 1.23. Asia: Deviation of the Cyclical Component of Credit-to-GDP Ratios from Long-Term Averages¹

(Number of standard deviations; as of 2010:Q4)

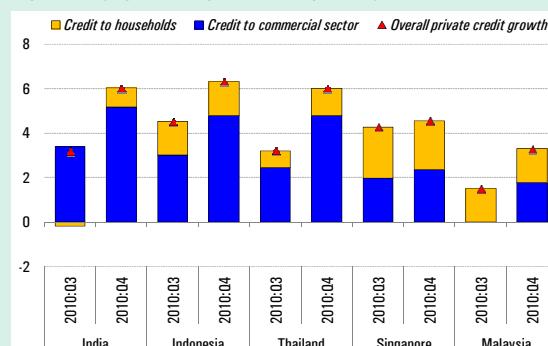


Source: IMF staff estimates.

¹ The cyclical component of the credit-to-GDP ratio is obtained by using the Hodrick-Prescott filter over 1990:Q1–2010:Q4.

Figure 1.24. Selected Asia: Contribution to Growth in Credit to Private Sector

(In percentage points of quarter over quarter growth)



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

Figure 1.25. Selected Asia: Comparing Changes in Current Real Property Prices with Previous Boom-Bust Cycles¹
(Year over year; in percent)

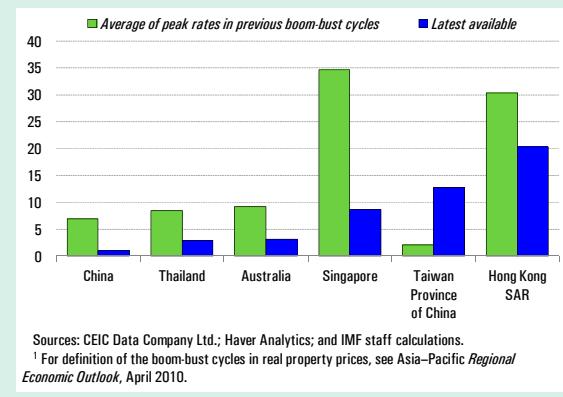


Figure 1.26. Asia: Government Bond and Stock Markets
(Change between October 2010 and March 2011; in percentage points)

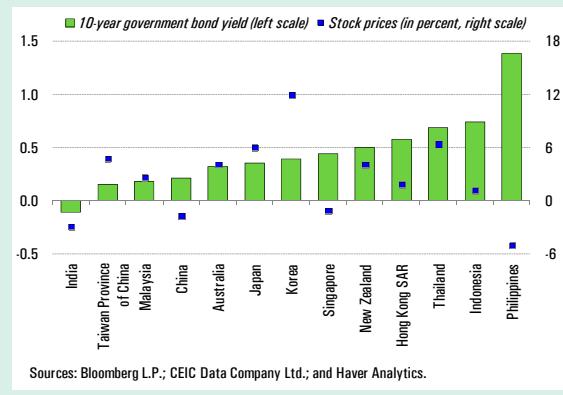
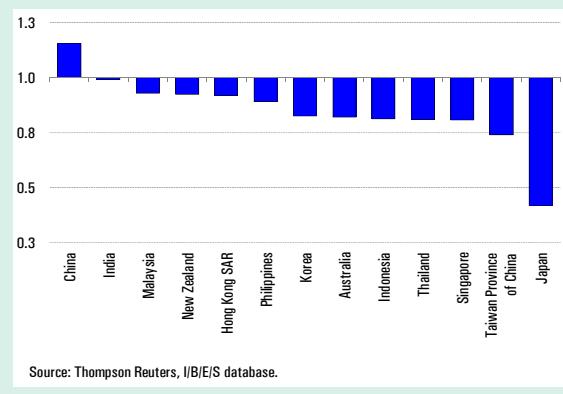


Figure 1.27. Selected Asia: 12-month Forward P/E Ratios
(Relative to long-term average; as of March 2011)



C. Capital Inflows Are Expected to Continue, but at a More Moderate Pace

Foreign capital flows to Asia have generally moderated since October 2010, although they have remained extraordinarily large in a few economies. As a share of regional GDP, net capital flows to Asia have neither reached the peaks of the 1990s nor their level during the period before the global financial crisis (Chapter II). In the fourth quarter of 2010, net capital flows to emerging Asia excluding China declined to about 1½ percent of regional GDP, from the recent high of 4¾ percent (reached in the second half of 2009, Figure 1.28). Portfolio inflows to emerging Asia have slowed since November 2010, possibly owing to investors' concerns about inflation and the policy response (Figure 1.29). A few economies, however, have continued to experienced large inflows. In the last quarter of 2010, net foreign capital inflows have accelerated in Indonesia and the Philippines, where they reached 12- and 8-year highs as a share of GDP, respectively, owing to robust portfolio (bonds and equities) inflows. Net foreign capital flows to China also accelerated in the last quarter of 2010, largely reflecting greater cross-border bank inflows from Hong Kong SAR.

Capital is expected to continue flowing to Asia in the next two years, but at a slower pace than in 2010 and with continued variation across regional economies. In the baseline scenario, capital flows to the region are expected to continue during 2011–12, attracted by strong growth, ample global liquidity, and continued improvement in risk appetite (Figure 1.30). Structural portfolio reallocation toward emerging market assets is also likely to support flows to Asia, as despite a threefold increase during 2004–09, the weight of emerging Asia equities in the Morgan Stanley Capital International (MSCI) all country world index is still only half the share of emerging Asia in global production. Within Asia, portfolio inflows are expected to remain robust in India and ASEAN-4 economies, and to

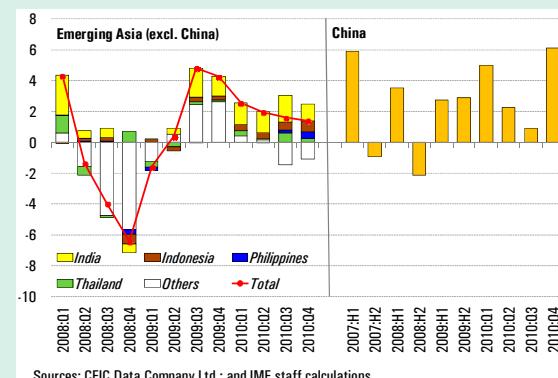
continue at a somewhat more moderate pace in China.

Nevertheless, greater capital inflow volatility remains a risk for several Asian economies. Sovereign and banking sector risks in the euro area, and large sovereign funding requirements in advanced economies, could raise risk premiums and negatively affect capital flows to Asian emerging economies. A stronger-than-expected recovery and the eventual withdrawal of monetary accommodation in the advanced economies could also cause more volatility in capital inflows. The April 2011 *World Economic Outlook* shows that net capital inflows to emerging economies are highly correlated with global financing conditions—with global interest rates and risk aversion playing an important role. U.S. monetary tightening tends to dampen net flows to emerging economies, particularly when the rate hikes are unanticipated. More volatile capital inflows into Asia could especially affect economies with current account deficits (India and Vietnam), relatively high shares of bonds and equities owned by foreigners (Indonesia and Malaysia), and greater dependence on wholesale foreign bank financing (Australia and Korea). But the impact on economic activity could be felt indirectly across the whole region, as more volatile capital inflows to Asia could hurt both investment and consumption, by increasing the cost of capital and reducing consumer confidence.

Policy responses to capital inflows so far have been appropriately narrowly targeted. Responses have varied considerably across the inflow-receiving countries, but they have been mostly targeted at specific types of portfolio flows, and their impact on domestic financial markets and institutions, rather than at trying to control all flows. The measures have essentially targeted five broad objectives (Table 1.2): (i) to mitigate complications for central bank market operations that stem from inflows to short-term instruments; (ii) to limit inflows to local bond markets; (iii) to reduce risks in both the banking system and the real economy; (iv) to limit

Figure 1.28. Emerging Asia: Net Capital Inflows

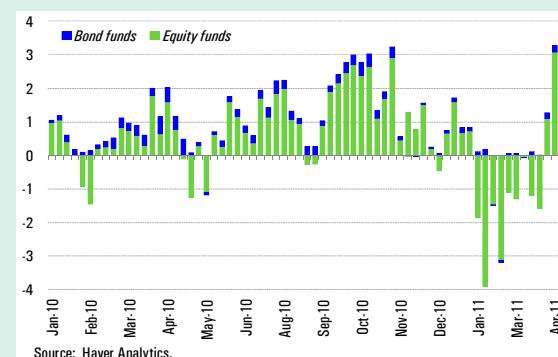
(In percent of GDP)



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

Figure 1.29. Emerging Asia: Equity and Bond Funds – Weekly Net Flows during 2010–11¹

(In billions of U.S. dollars)

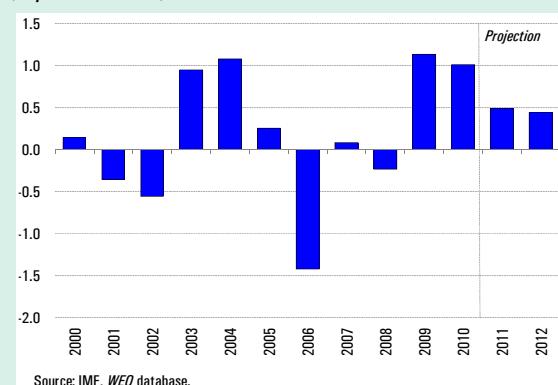


Source: Haver Analytics.

¹ Includes exchange traded fund flows and mutual fund flows.

Figure 1.30. Emerging Asia (excl. Hong Kong SAR and Singapore): Net Portfolio Capital Inflows

(In percent of GDP)



Source: IMF, WEO database.

REGIONAL ECONOMIC OUTLOOK: ASIA AND PACIFIC

Table 1.2. Capital Flow Management Measures in Asian Economies

Policy tool	Recent examples	Motivation/Objective
Limits to direct and indirect FX exposure	Korea (June 2010): Capped FX forward positions of banks relative to their equity capital. Reduce corporate FX hedging limit from 125 percent to 100 percent of export receipts.	By limiting derivatives positions, the measure indirectly targets a reduction in external borrowing by the private sector, particularly the banking sector. This exposure was also associated with carry trades onshore, including through “over hedging” of U.S. dollar receivables by Korean exporters.
Increase restrictions on external borrowing	India (December 2009): Re-instated interest rate cap on eligible external commercial borrowing that was eliminated during the crisis.	To limit access to foreign credit to best corporate credits and prevent high cost borrowing.
Minimum holding period on central bank bills	Indonesia (June 2010): One month holding period on central bank bills (SBIs) instated for both domestic and foreign investors.	To limit volatility of flows. SBIs had been subject to sharp shifts in positions relative to global risk appetite, as they were used as a carry-trade vehicle. Holding period limits the volatility of flows on exit from positions.
Limited foreign access to central bank instruments	Indonesia (June 2010–present): Phased out one- and three-month SBIs in favor of nine- and 12-month SBIs, and expanded supply of nontradable term deposits up to six months tenor, which are only available to banks operating in Indonesia.	To reduce volatility of inflows, and address concerns that central bank sterilization was attracting further inflows. Short-term SBIs, largely used to sterilize FX intervention, were a favored vehicle for carry trades.
Other restrictions on foreign access	Taiwan Province of China (November 2009): Financial Supervisory Commission (FSC) barred access to time deposit accounts for foreign investors. Taiwan Province of China (November 2010): FSC extended existing investment of nonresident inbound remittances in domestic securities to 30 percent, to include government securities of remaining maturity greater than one year.	To dampen speculative flows. Time deposits are one avenue for carry trades/ currency speculation. Reduced access of nonresidents to government bonds.
Measures to encourage outbound investment by residents	Malaysia (October 2010): Announced that the overseas investment limit of the Employee Provident Fund would be raised from 7 percent to 20 percent. Philippines (November 2010): Increased ceilings on residents' purchase of FX and foreign assets from authorized agent banks. Prepayment of private sector FX loans allowed. Thailand (February, September 2010): Raised ceilings on residents' outward direct investment, lending abroad, and foreign currency holdings.	
Reserve requirements on foreign currency and nonresident accounts	Taiwan Province of China (January 2011): Raised reserve requirement on local currency accounts held by nonresidents to 90 percent on balances exceeding the outstanding balance on December 30, 2010. Balances below end-2010 levels subject to 25 percent reserve requirement. Require reserves for such accounts are no longer remunerated. Indonesia (March 2011): Raised reserve requirement on foreign currency accounts from 1 percent to 5 percent. A further increase to 8 percent is scheduled for June 2011.	To effectively bar banks from offering interest-bearing accounts to nonresidents. Limit bank vulnerabilities to inflow volatility. Reduce incentives for banks to intermediate short-term inflows.
Withholding tax on foreign holdings of government bonds	Thailand (October 2010): Reimposed a 15 percent withholding tax (withdrawn in 2005) on nonresidents' interest earnings and capital gains on new purchases of government bonds. Korea (January 2011): Reintroduced a 14 percent withholding tax on foreign holdings of government bonds and central bank securities.	To slow inflows into government bond markets.

Source: National authorities.

vulnerabilities stemming from private sector external borrowing; and (v) to reduce currency speculation. The limited evidence so far suggests these measures have been more effective in altering the composition of inflows and in preventing overheating in asset markets than they have been in stemming capital inflows (see Pradhan and others, 2011). Only in a few cases have these measures discriminated based on the residency of investors and have generally remained “on the margin,” which explains why they have not resulted in a wholesale souring of market sentiments toward Asian economies.

Capital flows to Asia are not only a challenge, but also an opportunity to facilitate medium-term rebalancing. The question is how best to channel capital inflows toward financing broader-based growth, and in particular toward boosting investment. Capital market development could open up additional channels of funding for long-term investment, such as infrastructure, and would also lower the cost of capital and facilitate private investment in general. To seize this opportunity, authorities in the region would need to continue building the basic infrastructure of bond markets and expanding the investor base (Box 1.4).

Box 1.4. Channeling Capital Inflows to Its Most Productive Uses: Developing Corporate Bond Markets in Asia

Large portfolio flows into Asia present an opportunity to channel foreign savings into the most productive investment opportunities in the region and thus facilitate its rebalancing toward domestic sources of growth. In particular, capital inflows could help to address two important bottlenecks to higher investment in Asia:¹ financing constraints for small- and medium-size enterprises (SMEs) and shortfalls in infrastructure.¹

- SMEs, which tend to be more domestically oriented, labor intensive, and in service sectors, generally find it harder to access credit compared with larger firms, which are capital intensive and generally operate in the manufacturing and export sectors (figure).
- Infrastructure in emerging Asia has improved since the 1990s, but it still lags comparator emerging market regions in important respects, especially in ASEAN-5 economies (*October 2010 Asia and Pacific Regional Economic Outlook*). At the same time, in several emerging Asia economies the number of infrastructure investment projects with private participation peaked in late 1997, and has remained significantly lower over the last decade (figure).

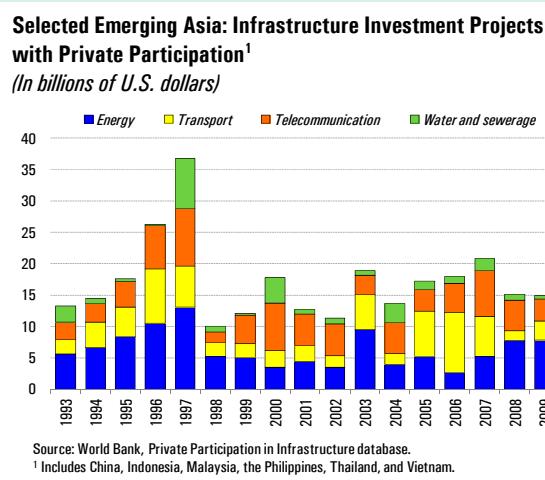
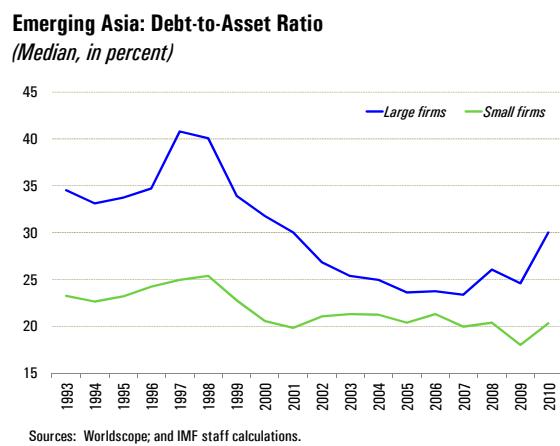
Large portfolio inflows could help alleviate these bottlenecks. To facilitate this, authorities in the region may need to further develop bond markets and expand the investor base. This would allow domestic firms to get access to foreign investors participating in these markets, including to finance infrastructure projects.

Measures that could help develop bond markets and expand the investor base include (Felman and others, 2010; and Gray, Carjaval, and Jobst, 2010):

- Continuously enhancing and streamlining disclosure requirements for bond issuances, and improving transparency on issuers, for example through standardized reporting and wider credit scoring. This is of particular importance for reducing information gaps and attracting investors to smaller firms.
- Issuing government bonds at longer maturities and ensuring liquidity at the whole maturity spectrum, to facilitate longer-term maturity issuance.
- Allowing highly rated corporate securities to be used as collateral by commercial banks at the central bank facilities.
- Establishing central clearing counterparties, to reduce counterparty risks. Such counterparties would enforce the specific terms of contracts until maturity, as well as guarantee the fulfillment of the contracts.

Note: The main author of this box is Sergei Dodzin.

¹ See IMF (2010c).



Box 1.4. (concluded)

- Standardizing and consolidating central securities depositories (CSD) and improving cross-border clearing and settlement arrangements, including through links between regional CSDs.
- Streamlining and reducing distortions in tax regimes. In particular, reforming withholding taxes and ensuring comparability of treatment across regional bond markets.
- Strengthening legal and regulatory frameworks for local derivative markets, including by aligning local and international accounting standards, to facilitate the development of hedging mechanisms in local markets.

D. Policy Challenges: Tightening Macroeconomic Policy Stances to Contain Overheating Risks

Against the background of strong economic growth and overheating concerns, the need to tighten macroeconomic policy stances in Asia has become more pressing now than it was six months ago. The extent and pace of tightening that is needed varies across economies. Although many regional economies started making macroeconomic policy conditions less accommodative in 2010, the tightening cycle has generally been slow, possibly reflecting lingering doubts about the strength of the global recovery and of private domestic demand in Asia. As the global recovery has been consolidated, and supply constraints have started to emerge in Asia, a few economies in the region now need to catch up in terms of the pace and size of the required adjustment.

Further monetary policy tightening is necessary in economies facing generalized overheating pressures:

- Taylor rules suggest that, so far, several Asian economies have increased policy rates more slowly than in the past. Policy rates in March 2011 were generally below the levels predicted by IMF staff estimated rules (Figure 1.31), particularly in India, Indonesia, Korea, and Thailand.
- Real policy rates are still negative in several regional economies, including China, Korea, and India, and much lower than historical averages in Indonesia (Figure 1.32). Even if signs of

overheating are mixed, keeping real interest rates too low for too long could contribute to financial instability, through a deterioration of the quality of capital spending, resource misallocation, higher leverage, and asset price bubbles. In Australia and New Zealand, where banks have shifted toward medium-term wholesale funding and retail deposits, the increase in bank funding costs has made monetary conditions tighter than policy interest rates alone would suggest.

Exchange rate appreciation should be a key line of defense to avoid overheating. Exchange rate appreciation would tighten monetary conditions and reduce the burden to be borne by interest rate tightening. Despite recent appreciations, real effective exchange rates remain close to precrisis levels in many emerging Asian economies, and in a few cases (Hong Kong SAR, Korea, and Vietnam) significantly below those levels (Figure 1.33). Indeed, Asia's shares of the U.S. and E.U. import markets are currently at precrisis levels, despite the recent appreciation. And for many regional currencies, strong current account surpluses continue to be a more important source of excess demand, and reserve accumulation, than net capital inflows (Figure 1.34). The increase in foreign reserves since mid-2010 in many emerging Asian economies partly reflects positive valuation effects from higher asset valuations in advanced economies. But it also suggests that exchange rate appreciation pressures have continued to be met by intervention in foreign exchange markets.

The administrative measures that several Asian policymakers have implemented to counter food

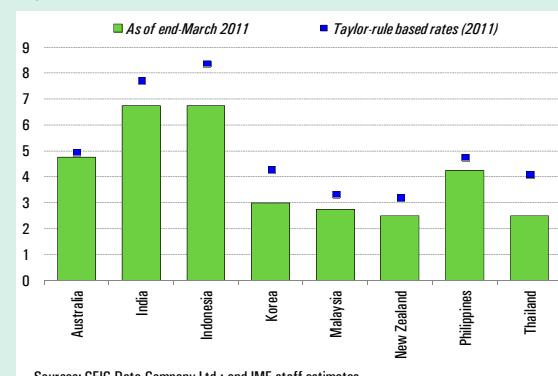
price inflation may have only a temporary impact on inflation and will impose fiscal costs over the medium term. Given the limited impact and distortionary nature of these measures, it might be preferable to respond to higher global commodity prices by accommodating the first-round pass-through into domestic prices and stand ready to tighten policies to avoid second-round effects that could lead to a more persistent rise in inflation.

In economies that still face large capital inflows, macroprudential measures can usefully complement monetary policy in addressing specific financial vulnerabilities and concerns. Over 2010, concerns that wider interest rate differentials could give rise to further capital inflows induced several regional central banks to keep policy rates low, even as capacity constraints and core inflation pressures started to surface. Strong inflows into bond markets also compressed long-term yields, raising doubts on whether policy rate increases could tighten the monetary stance. Still, a combination of monetary tightening and prudential measures would be effective in dealing with domestic overheating pressures and threats to financial stability from volatile capital inflows:

- Reduced uncertainty about the strength of global recovery and prospects for an earlier-than-expected start of the tightening cycle in the United States and other advanced economies could give Asian central banks more room to tighten. Indeed, long-term yields have increased in Asia over the last few months, in line with the moderation of capital flows to the region. Nonetheless, Chapter II suggests that an effective tightening of the monetary policy stance in Asia will require higher short-term interest rates.
- In regional economies that face signs of overheating in asset markets, monetary policy tightening could be complemented by measures that address specific financial stability risks. Many of the prudential measures adopted in Asia in 2010 were designed to minimize the

Figure 1.31. Selected Asia: Policy Interest Rates

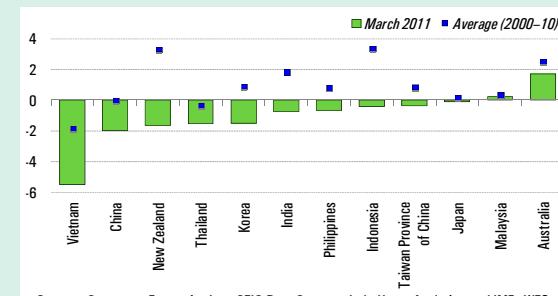
(In percent)



Sources: CEIC Data Company Ltd.; and IMF staff estimates.

Figure 1.32. Asia: Real Policy Rates¹

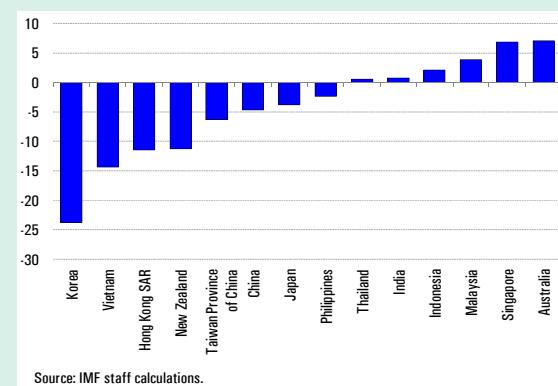
(In percent)



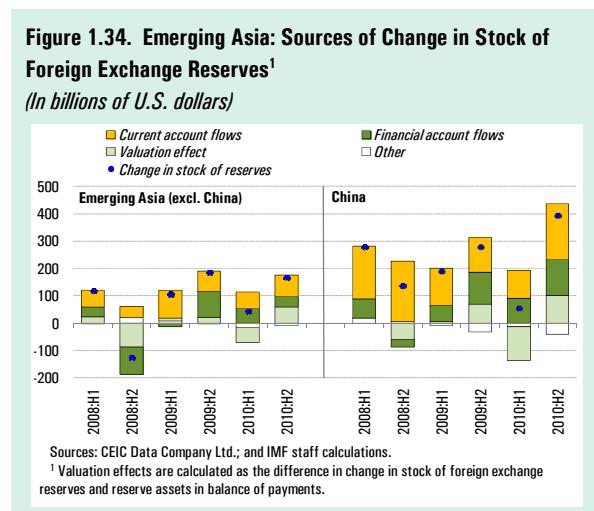
Sources: Consensus Economics Inc.; CEIC Data Company Ltd.; Haver Analytics; and IMF, WEO database and staff calculations.

¹ Real policy rates are defined as nominal policy rates adjusted for one-year ahead inflation expectations (from WEO database for 2011 and Consensus Inc. for other years). Wholesale prices used for India.**Figure 1.33. Asia: Real Effective Exchange Rates**

(Percent change between peak in 2007–08 and March 2011; increase implies appreciation)



Source: IMF staff calculations.



risks to financial instability from large capital inflows, particularly in the case of a sudden reversal. Although it is too early to assess the effectiveness of these measures, Chapter II suggests that they may help reduce economic volatility by targeting the impact of capital inflows on specific asset markets and leverage.

Several economies in the region have room for further fiscal consolidation. In a few economies (Indonesia, Singapore, and Taiwan Province of China), fiscal policy is expected to add stimulus in 2011, while other economies (including Australia and China) are expected to withdraw fiscal stimulus in 2011. But, generally, fiscal stances in the region are still accommodative: IMF staff estimates of cyclically adjusted fiscal balances for 2011 show generally lower surpluses or higher deficits relative to precrisis (2002–07) averages (Figure 1.35). Fiscal consolidation would also expand fiscal space and increase the scope for governments to respond effectively to potential future shocks. For economies benefiting from higher commodity prices, such as Australia and New Zealand, some of the boost to government revenues could be saved in order to ensure a more equal distribution of its benefits across generations and reduce long-term fiscal vulnerabilities from an aging population and rising health care costs.

A tightening of macroeconomic policies is a priority also in most Asian LICs. In some

economies, there is an immediate need for monetary tightening (Bangladesh and Nepal), whereas in others, the critical need is for fiscal policy tightening (Cambodia, Lao P.D.R., Mongolia, and Sri Lanka). Enhancing fiscal revenue is important for fiscal consolidation and would help create fiscal space for much needed development spending. Policies also need to be geared toward addressing longer-term issues, including public financial management (Nepal and Lao P.D.R.); natural resources management (Papua New Guinea); and enhancing banking supervision and risk-management practices (Lao P.D.R. and Cambodia).

E. The Economic Impact of Japan's Earthquake-Related Tragedy

The earthquake and tsunami that devastated much of Japan's northeast coastal region in March 2011 resulted in terrible human losses and will impact economic activity over the coming months, not only in Japan but also in other Asian economies. In particular, industrial production will be affected by the physical destruction of infrastructure and production facilities, widespread electricity shortages, and the ripple effect across productive sectors through the supply chain. At the same time, consumer and business sentiment could also suffer, given the size and duration of interruptions in normal activity and the concerns about radiation contamination that have followed the crisis at the Fukushima nuclear plant.

The experience after the Great Hanshin-Awaji (Kobe) earthquake in January 1995 may provide some clues as to the economic impact of this recent tragedy. In the case of the Kobe earthquake, industrial production declined by 3 percent in the first month after the earthquake but rebounded quickly, and reached pre-earthquake levels within one quarter. Reconstruction led to an investment boom and, as employment rose and confidence strengthened, retail sales began to rise again after one quarter. As a result, GDP growth picked up in 1995 to 1.9 percent from 0.9 percent the previous year. The quick turnaround was also helped by ample private sector capacity in other regions, and

limited nationwide damage to power generation and transportation infrastructure.

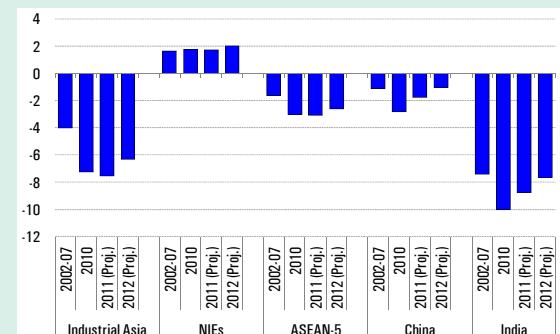
However, the Great East Japan earthquake differs in several critical dimensions from previous ones. First, at between 3 and 5 percent of GDP, initial estimates of the damage to infrastructure are about twice as large as those caused by the 1995 Kobe earthquake (Figure 1.36). The area affected by electricity supply interruptions is also much larger, and includes the entire Kanto region around Tokyo, which accounts for around 40 percent of GDP. Restoration of capacity is likely to take longer this time, due to severe damage to thermal and nuclear power plants and to key component suppliers in the area, especially in electronics and automobiles, implying possibly greater supply disruptions in the production chain than after the Kobe earthquake. Finally, macroeconomic policy space is more limited with interest rates near the lower bound and public debt at very high levels.

Taking into account these differences, IMF staff have revised growth in 2011 down to 1.4 percent from 1.6 percent in their pre-earthquake scenario. The downward revision reflects both a substantially larger decline in activity than after the Kobe earthquake, which would be partially offset by a sizable policy response. More specifically, private domestic demand in 2011 is expected to decline by 1 percentage point, as a result of the severe damage to capital and electricity supply. But growth is expected to be lifted by a stronger contribution from the public sector, in particular through a series of fiscal packages (estimated at 0.8 percent of GDP) primarily targeted at infrastructure investment. While the reconstruction costs will add to the fiscal deficit in 2011, the amounts are likely to be manageable and the spending will be temporary. In 2012, growth is expected to accelerate to 2.1 percent on the back of reconstruction efforts.

Easy monetary conditions are also expected to support activity. The Bank of Japan acted decisively to ensure stability in financial markets following the earthquake, expanding its balance sheet by more than 10 percent through short-term liquidity

Figure 1.35. Asia: General Government Cyclically Adjusted Fiscal Balances¹

(In percent of GDP)

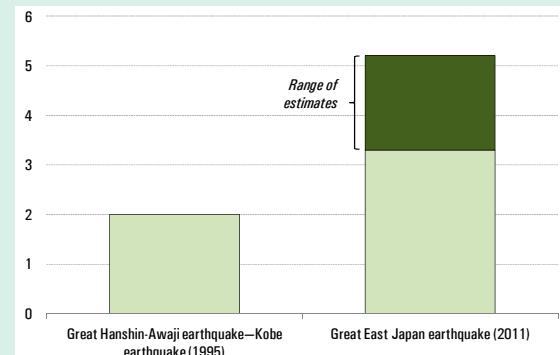


Source: IMF, WEO database.

¹ Balances refer to calendar years.

Figure 1.36. Japan: Official Estimate of Damage to Capital Stock following 1995 and 2011 Earthquakes

(In percent of GDP)



Source: Country authority.

injections and doubling the size of its financial asset purchase program to ¥10 trillion. This response builds on a series of monetary easing measures introduced in Japan over the last two years, which have been relatively successful in stabilizing financial markets and reducing risk premiums (Box 1.5). In April 2011, the Bank of Japan also announced the impending introduction of a loan program to assist financial institutions in disaster areas.

There are, however, significant downside risks to the outlook. Unlike after Kobe, lingering uncertainties surrounding the nuclear issue and the interruption of power generation could delay the recovery by disrupting production across the country and weighing on sentiment. In this case, policies to repair damaged infrastructure and

Box 1.5. How Effective Are the Bank of Japan's Monetary Easing Measures?

Faced with a moderating recovery and persistent deflation, the Bank of Japan has expanded its policy toolkit by introducing a broad series of monetary easing measures to achieve sustainable growth and price stability (table). The measures are broad in scope. This box assesses the extent to which the measures have been effective in achieving their objectives, and concludes that the measures have a positive initial impact. It is too early, however, to assess the effect on economic activity and the inflation outlook. The positive impact and relatively modest scale of easing so far would suggest that further targeted monetary easing may help lower risk premiums and catalyze investment.

Bank of Japan Measures

Measures	Description	Date	Current target scale (in trillions of yen)	Actual balance as of March 10, 2011 ^{1,2}
Increase in purchases of government bonds	Expand measures to ensure financial stability.	December 2008	21.6 trillion yen on JGB per year	60 trillion yen
	Subsequent size expansion on Japanese government bond (JGB) purchases.	March 2009		
Fixed-rate funds-supplying operation against pooled collateral	Provide ample funding at low interest rate to banks to ease financing conditions, thereby encouraging the decline of long-term rates.	December 2009	30 trillion yen	25.6 trillion yen
	Subsequent size expansion and maturity extension.	March and August 2010		
Providing support to strengthen the foundations for economic growth	Provide long-term funds at low interest rate to eligible financial institutions to finance actual investment projects in selected industries that support the foundations of economic growth.	April 2010	Not exceeding 3 trillion yen	2 trillion yen
	Subsequent announcement of operational framework, principal terms and conditions, and disbursements.	May, June, September, and December 2010; March 2011		
"Comprehensive Monetary Easing (CME)"		October 2010		
Virtually zero-interest rate policy	Guide expectations on the duration of accommodative stance of monetary policy.			
Asset Purchase Program	Encourage the decline of long-term interest rate and catalyze investors' risk appetite to reduce risk premium. Preempt a deterioration in business sentiment and rise in risk aversion.	March 2011	40 trillion yen	30.3 trillion yen

Source: Bank of Japan.

¹ Outstanding balance of government securities include previous purchases before easing measures introduced. Excluding treasury bills.

² The size of the asset purchase program was expanded by 5 trillion yen to 40 trillion yen on March 14, 2011, of which 30 trillion yen is related to the fixed-rate funds supplying operations.

The easing measures are intended to stimulate growth and overcome deflation by lowering funding costs and boosting private credit through various channels:

- The new funding operations intend to reduce short-term interest rates by providing financial institutions with ample funds at extremely low interest rates.
- Meanwhile, the asset purchase program could ease broad financing conditions by lowering interest rates and serving as a "catalyst" to raise investors' risk appetite.
- The commitment to a virtually zero interest rate policy (VZIRP) could guide expectations on the duration of accommodative stance of monetary policy. As a result, long-term real interest rates could fall, anchoring higher inflation expectations.

Note: The main author of this box is W. Raphael Lam.

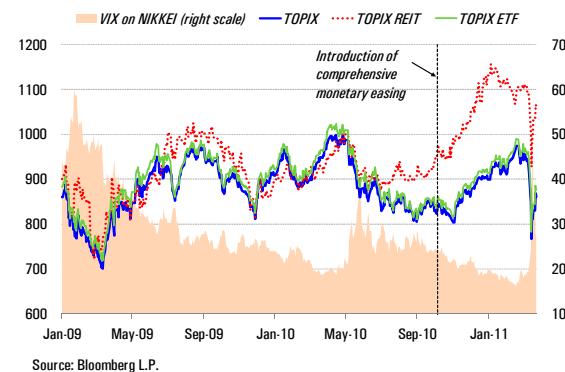
An event study is used to assess the initial impact of the Bank of Japan's measures on funding costs and private credit.¹ The events are selected based on the dates on which the Bank of Japan announced and implemented its new measures since December 2009, and the changes of several high-frequency financial indicators around these events are compared with the changes in a typical trading day.

The result shows that, asset prices have tended to react favorably to the Bank of Japan's measures, although the magnitude of the response appears to be small (figure). Across the identified events, the 10-year JGB yield has cumulatively fallen by more than 20 basis points after the Bank of Japan announcements, and the 2-year JGB yield by more than 10 basis points (figure). This compares with a change of 0.1 basis points in a typical two-day trading window for each variable (figure). The overall effects are statistically significant, but small compared with the effects of monetary easing by other central banks, when controlling for the size of easing.²

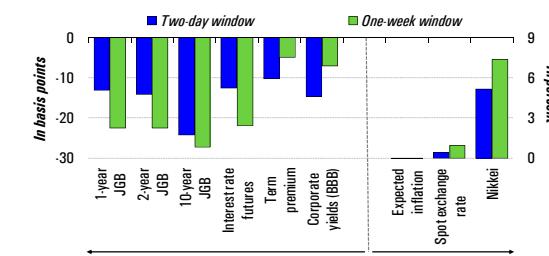
Although yields typically continued to decline in the week after the events, the greatest impact came with the immediate announcement. The term premium also tended to fall, along with a flattening of the yield curve. Corporate yields tended to decline initially, but reverted by the end of the following week. Equity prices have tended to increase by more than 5 percent, and the increase is statistically significant compared with typical trading days. But, monetary easing had almost no measurable effect on the exchange rate or inflation expectations.

Across industries, the Bank of Japan's easing measures were most effective in affecting the financial and real estate sectors (figures on next page). Equity prices of insurance companies and large banks rose strongly relative to the market index (more than 10 percent in total across the events identified) after the Bank of Japan announcement, and the increase persisted through the following week. By contrast, equity prices in other sectors did not show significant excess return (after adjusting for industry-beta) compared with the overall market, which has increased by more than 5 percent. Throughout the periods of the Bank of Japan's easing measures, financing conditions have continued to ease, but credit demand remained weak, continuing to fall on a year-over-year basis.

Japan: Equity Markets



Japan: Impact of Monetary Easing on Financial Markets^{1,2}



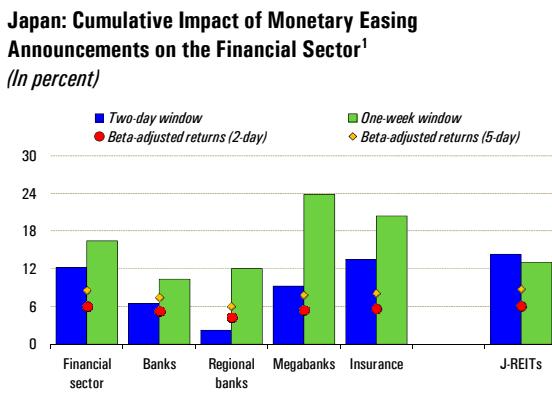
Sources: Bloomberg L.P.; and IMF staff estimates.

¹ Events defined as the announcement dates of powerful monetary easing by Bank of Japan. Impact on both windows for JGBs, interest rate futures, term premium, and Nikkei; and two-day window for corporate yield are statistically significant at 5 percent level.

² Interest rate futures refer to 3-month futures and term premium is defined as 10-year net of 2-year sovereign yields.

¹ Each event carries a window of a week or two trading days, around the announcement day. Financial indicators include short- and long-term government bond yields, corporate bond yields, equity price and subindices, term premium, implied volatility, exchange rate, and inflation expectations.

² Using event study methodology, Gagnon and others (2010) and Neely (2010) both find significant impacts on financial markets of the large-scale asset purchase programs by the U.S. Federal Reserve. Specifically, the 10-year Treasury yields fell cumulatively by about 100 basis points between November 2008 and mid-2009, and the term premium also declined following the asset purchases.

Box 1.5. (concluded)**Japan: Cumulative Impact of Monetary Easing Announcements on the Nonfinancial Corporate Sector¹ (In percent; by size and credit status)**

Category	Two-day window	Beta-adjusted return (2-day)	One-week window	Beta-adjusted return (5-day)
Small-sized	~2%	~2%	~4%	~5%
Medium-sized	~4%	~3%	~6%	~6%
Large-sized	~5%	~5%	~9%	~7%
Good credit status	~4%	~3%	~4%	~4%
Poor credit status	~4%	~2%	~5%	~4%

Sources: Bloomberg L.P.; and IMF staff estimates.

¹ Impact measured in a 2-day or weekly event window. Beta adjusted return is calculated as industry beta multiplied by the market return. None of these are statistically significant at 5 percent level from the adjusted returns.

Overall, the asset purchase program introduced in October 2010 appears to have lowered the tail risks in financial markets. Implied volatility on asset prices declined significantly following the Bank of Japan's announcement of the asset purchase program, thereby reducing risk premiums and improving investors' risk appetite. Markets' perceived risk of a double-dip recession receded. Reinforcing other favorable external factors, the program likely helped stabilize Japan's economic outlook.

promote reconstruction spending would play an important role in addressing the uncertainties and supporting the recovery.

The impact of Japan's natural disaster is also likely to be felt well outside its geographical borders, mainly through trade channels. To be sure, lower demand from Japan for regional exports will have only a limited impact on other Asian economies, as their exposure to Japan's final demand is small, generally below 5 percent of their GDP. This implies that for each 1 percentage point decline in Japanese final demand, the first-round impact on other Asian economies would generally be less than 0.1 percentage points.

However, a stronger impact could be felt on the supply side. As discussed in Chapter III, Asian economies are highly integrated through cross-border production networks. While these networks have become increasingly centered on China, Japan remains the second most important source of imported intermediate inputs in the region. Accounting for direct and indirect supply linkages,

inputs from Japan account for about 10–15 percent of the value added produced in some Asian economies, including Malaysia, Thailand, and Taiwan Province of China (Figure 1.37). In the near term, the drawdown of inventories could provide an important buffer. Over time there could also be a switch to alternative suppliers, although Japan's status as a highly specialized supplier of electronic components and capital goods suggests limits to this strategy. But more prolonged disruptions to production in Japan could eventually affect other economies along the global supply chain, in particular those industries where Japanese supplies constitute a significant share of global supply, such as advanced materials (e.g., silicon wafers for microchips).

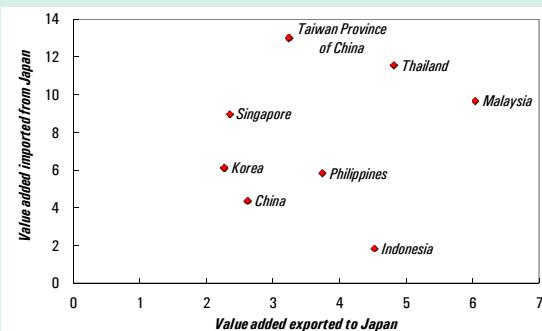
F. Making Growth Balanced and Inclusive Over the Medium Term

Overall in the region, the rebalancing of growth toward private domestic demand may prove only temporary in the absence of measures that address the structural constraints on domestic demand.

- For the region as a whole, gross exports are expected to contribute more than private domestic demand to growth in 2011–12 and more than they did on average during 2002–07 (Figure 1.38). The contribution of private domestic demand to GDP growth is expected to increase significantly only in Indonesia and Malaysia. By contrast, the contribution of gross exports to growth is expected to rise in almost all regional economies, with the exception of Hong Kong SAR, Singapore, and Taiwan Province of China.
- The projected evolution of current accounts in Asia suggests that rebalancing may be slow, although with some differentiation across the region (Figure 1.39). The current account surplus of the Asia and Pacific region as a whole is expected to decline only slightly over the next two years, from about 3½ percent of GDP in 2009 to 3¼ percent of GDP in 2012. Relative to their average in the precrisis period, external surpluses are expected to increase somewhat in China and to remain stable in the NIEs. They are, however, expected to decrease over the next two years in the ASEAN-5 economies.

Over the longer term, the main challenge for Asia's policymakers remains to achieve a balanced, sustainable, and more inclusive pattern of growth. As the surpluses of oil-exporting countries narrow marginally, and the balances of other emerging surplus and advanced deficit economies widen, global imbalances, which had declined in 2009 with the collapse in global trade during the crisis, are now foreseen to remain elevated over the medium term (Figure 1.40). The persistence of global imbalances suggests that many of the distortions that characterized the precrisis period remain unchanged, such as undervalued exchange rates in key emerging surplus economies and insufficient domestic saving in advanced deficit economies. Without policies targeted at correcting these underlying distortions, they could threaten global growth prospects. In this regard, it should be noted that IMF staff projections point to a somewhat slower reduction of global imbalances than anticipated in the context of the

Figure 1.37. Selected Asia: Demand and Supply Exposures to Japan
(In percent of total value added)



Sources: Japan External Trade Organization (JETRO), *Asian Input-Output Table* (2000); and IMF staff calculations.

Figure 1.38. Asia: Contributions to GDP Growth
(Year over year; in percentage points)

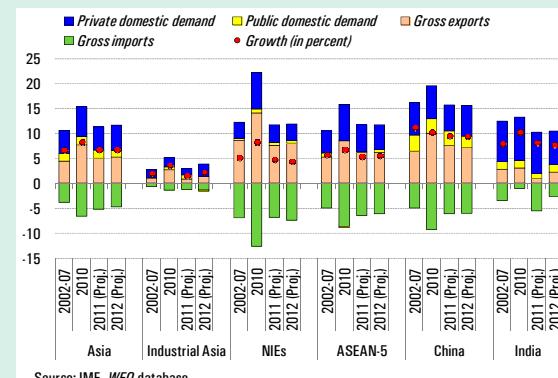
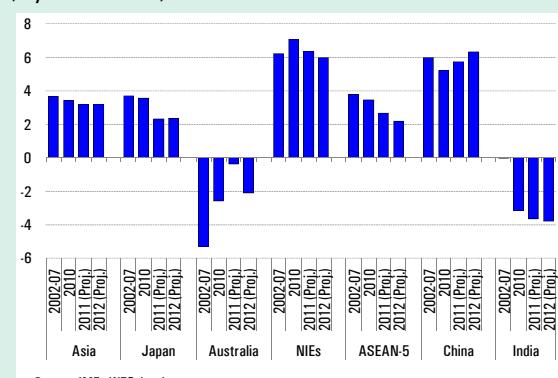


Figure 1.39. Asia: Current Account Balances
(In percent of GDP)



REGIONAL ECONOMIC OUTLOOK: ASIA AND PACIFIC

Figure 1.40. Global Current Account Balances
(In percent of world GDP)

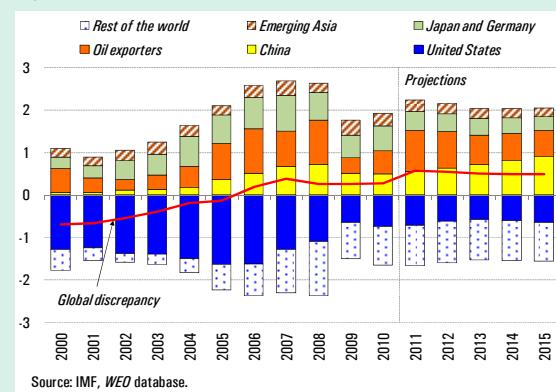
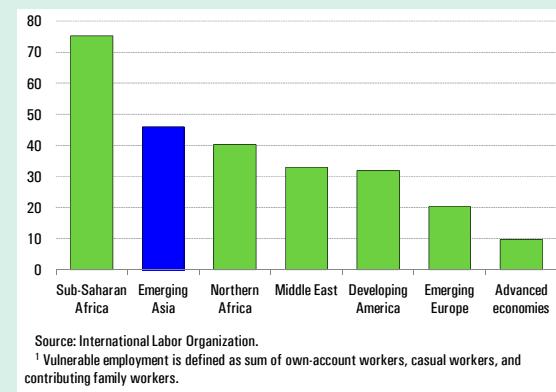


Figure 1.41. Vulnerable Employment¹
(In percent of total employment)



November 2011 G-20 Mutual Assessment Process (MAP), which suggests a more optimistic assessment by some G-20 authorities on the effectiveness of the policies envisaged in these economies to secure strong, sustainable, and balanced growth over the medium term.

Policies to strengthen domestic demand in Asian emerging economies are not inconsistent with the

need to tighten the macropolicy stance to deal with overheating risks. Many of these policies are structural and thus should strengthen demand mainly over the medium term; for example, by strengthening social safety nets or boosting investment in infrastructure. Insofar as these policies have a stimulative effect on economic activity in the short term, which adds to an already strong cyclical position, they could be matched by contractionary measures; for example, a reduction in current public spending. Letting the exchange rate appreciate more, on the other hand, would be consistent with a countercyclical macropolicy stance and, at the same time, would facilitate rebalancing toward internal demand.

Although the impact of the crisis on employment in Asia has been smaller than in other regions, a large share of employment remains vulnerable, and income inequality remains high. In contrast to many regions around the world, labor markets in Asia have not suffered a strong impact from the crisis. Aggregate employment figures, however, may underestimate the impact of the crisis on Asian labor markets, given the relatively large size of the informal sector in the region. A relatively high number of workers are in employment categories deemed to be more vulnerable and carrying a higher economic risk (Figure 1.41). This is especially a concern, given the limited scope of social protection programs in emerging Asia. Narrowing income inequality through inclusive labor markets and stronger social protection systems would also be instrumental to a more balanced pattern of growth, one that relies on strong private domestic demand in addition to the traditionally buoyant export sector.

II. CAPITAL FLOWS TO ASIA: COMPARISON WITH PREVIOUS EXPERIENCE AND MONETARY POLICY OPTIONS

A. Introduction

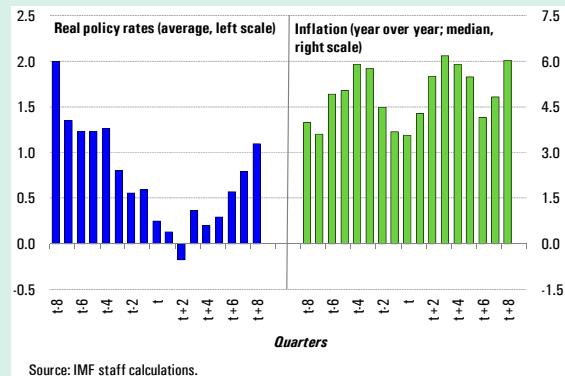
The rapid resumption of capital flows into emerging Asia since mid-2009 has posed two sets of challenges to policymakers in the region. First, although many regional economies are experiencing inflation pressures, policymakers have been reluctant to increase policy rates for fear of attracting more capital inflows. This is in line with previous surges of capital flows to the region, when real policy rates across Asia have on average taken more than 8 quarters to regain their pre-“surge” levels (Figure 2.1). However, as Chapter I discusses, exchange rate appreciation and tighter fiscal policy can play a role in combating overheating pressures, but so must monetary policy.

A second challenge for policymakers in several Asian economies is to manage the financial stability implications of large capital inflows. Unusually strong cyclical and policy differences between advanced economies and emerging Asia in 2009 and 2010, and a gradual shift in portfolio allocation toward emerging markets, have led to portfolio inflows that, for a few Asian economies, are large in relation to the absorptive capacity of domestic markets. Despite the slowdown since late 2010, portfolio inflows to emerging Asia are expected to continue over the next two years, especially in India and the ASEAN-5 economies. As noted in Chapter I, however, risks of greater volatility in capital flows have intensified compared with six months ago. Policymakers in the region thus need to remain mindful of the risks that a sharp reversal or sudden stop of these inflows could pose for domestic financial markets.

Note: The main authors of this chapter are Ravi Balakrishnan, Sonali Jain-Chandra, Sylwia Nowak, Sanjaya Panth, D. Filiz Unsal, and Yiqun Wu. Souvik Gupta provided research assistance.

Figure 2.1. Selected Emerging Asia: Real Policy Rates and Headline Inflation during Capital Inflow Surges

(In percent; t = beginning of capital inflow surge)



Source: IMF staff calculations.

Against this background, this chapter focuses on the following three main questions:

- How does the surge of capital flows to Asia since the global recession compare with previous episodes of large capital flows to the region?
- Do large capital flows tend to weaken the monetary policy transmission mechanism in Asia and, therefore, the effectiveness of monetary tightening?
- What is the role of macroprudential regulations in helping monetary policy reduce economic volatility?

The chapter has three main conclusions. First, although as a share of GDP net capital flows to Asia are below previous peaks, and there is still little evidence of a significant buildup of financial imbalances, the rapidity of the surge and its concentration in potentially volatile portfolio inflows do raise concerns in a few Asian economies. Second, whereas large capital inflows complicate monetary policy by depressing long-term yields, monetary

policy in the region still has an important influence on economic activity, as the interest rate channel of monetary policy in Asia largely relies on short-term interest rates. Third, macroprudential measures have a useful role to play in reducing economic instability that could arise from surges in capital inflows. These measures, however, should not be a substitute for monetary tightening.

B. How Does the Current Episode of Capital Inflows Compare with Previous Episodes?

Net capital flows to emerging Asia have rebounded at a record pace since the global financial crisis. There have been two other major episodes of inflows to emerging Asia over the past two decades. The first episode began in the early 1990s and ended abruptly with the 1997–98 financial crisis; the second began in the early 2000s and again ended abruptly with the global financial crisis (Figure 2.2). What is remarkable about the current episode is the speed of the recovery. Within just 5 quarters, net inflows rose from a recent trough (in early 2009) to their recent peak (in mid-2010). In contrast, the length between the troughs and peaks was about 25 quarters during the pre-Asian crisis period and the period before the global financial crisis.

Overall net capital flows to emerging Asia as a share of GDP have been generally lower than in previous surges. As a share of regional GDP, net capital inflows peaked at about 4 $\frac{1}{4}$ percent of GDP in the last quarter of 2010, against 6 $\frac{3}{4}$ percent in both the second quarter of 1996 and the first quarter of 2004. Gross flows do not paint a starkly different picture, as the preglobal crisis period had higher gross inflows and outflows than the current period.¹ Unsurprisingly, the aggregate numbers hide some sizable variations. As a share of GDP, net capital inflows have reached record highs after the global crisis in the NIEs, reflecting extraordinary banking-

¹ Gross inflows and outflows generally appear to be on a secular trend upward before the global financial crisis, likely reflecting continued financial globalization during the Great Moderation.

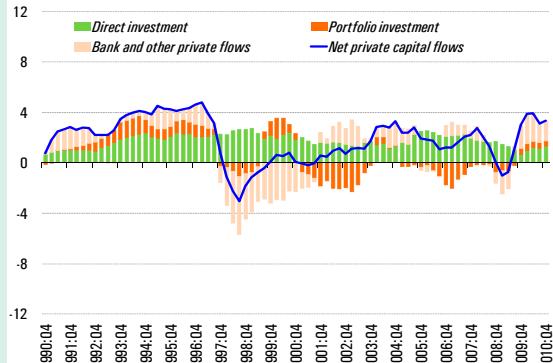
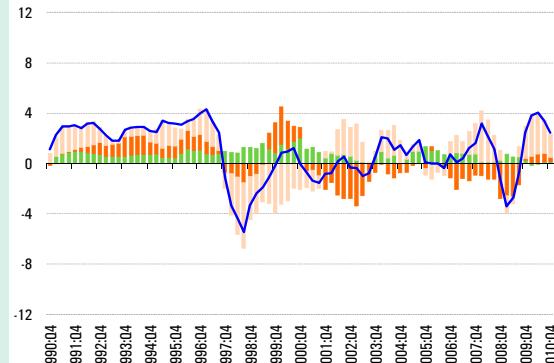
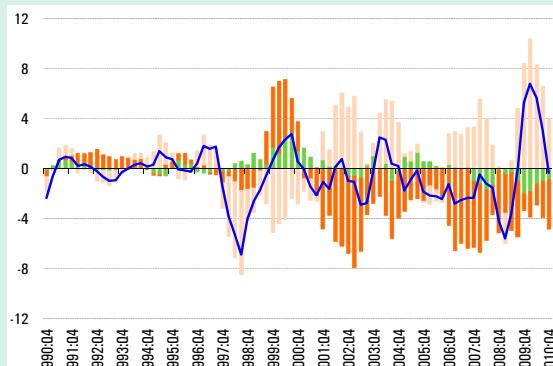
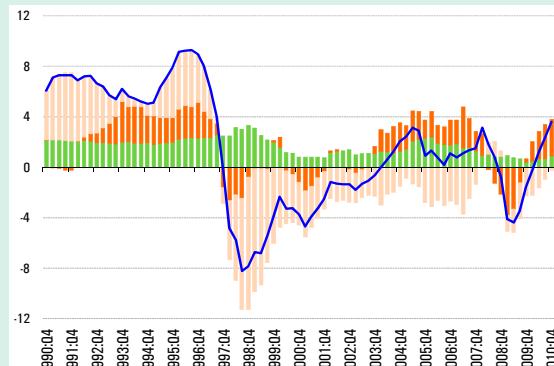
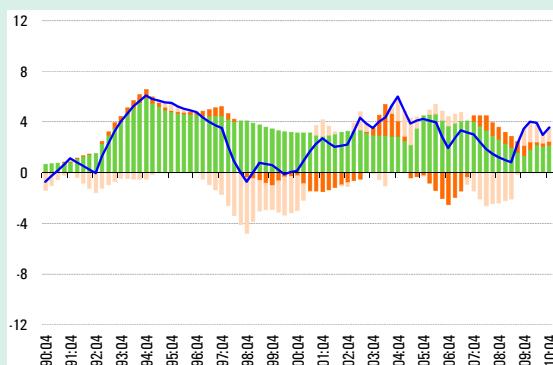
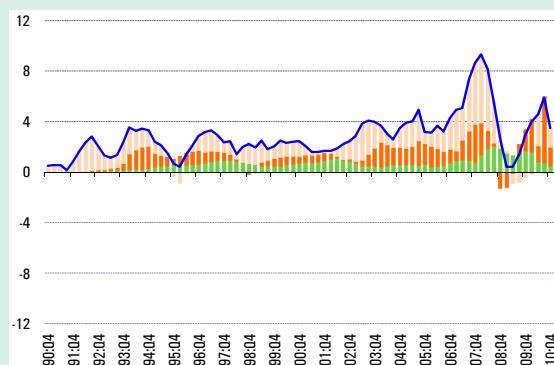
related flows to Hong Kong SAR and portfolio debt flows to Korea. By contrast, net capital flows to the ASEAN-5 economies have remained below the peaks reached in the previous two surges, as the increase in portfolio debt flows has been more than offset by declines in FDI and banking flows. Net capital inflows have also remained below precrisis peaks in both China and India.

Several regional economies, however, have experienced record-high portfolio flows. The post-crisis wave of capital inflows has been more geared toward debt flows compared with previous ones. This trend has been most pronounced in portfolio debt flows into countries where local bond markets are relatively large, such as Indonesia, Korea, and Malaysia. In Malaysia, record high portfolio inflows after the global crisis have been offset by other large outflows. Debt flows to the banking sector have remained important also for Hong Kong SAR, reflecting the importance of the banking sector in this country. India has also experienced a record surge in portfolio inflows, but of the equity kind.

To put the recent surge of capital inflows into historical perspective, this chapter identifies episodes of large net private capital flows to Asia over the last two decades. The focus is on net capital flows after stripping out official flows, and a “surge” in capital flows is defined by following the methodology outlined in IMF (2007a). Broadly speaking, under this definition, an episode of large net private capital flows for a particular country is a period of two or more quarters during which these flows (as a share of GDP) are significantly larger (one standard deviation) than their historical trend, or above the 75th percentile of their distribution over the whole sample.

The event analysis confirms that the recent surges have generally been smaller than in the past. On the basis of the definition above, 31 surges in net private capital flows to Asia have occurred during the last

Figure 2.2. Emerging Asia: Net Private Capital Flows¹
(In percent of GDP; 4-quarter moving average)

Emerging Asia**Emerging Asia (excl. China)****NIEs****ASEAN-5****China****India**

Sources: CEIC Data Company Ltd.; and IMF, *Balance of Payments Statistic*, *WEO* database, and staff calculations.

¹ Missing historical observations have been approximated by annual data obtained from *WEO* database.

20 years. Most of these episodes (13) occurred before the global financial crisis (Table 2.1). There were fewer episodes in the run-up to the Asian crisis (10) but they were of longer duration (about 25 quarters, on average). Only 8 episodes of large capital inflows have occurred after the global financial crisis, averaging about 4 percent of GDP (compared with about 5 percent in the 1990s) and lasting only 5 quarters. Indeed, of these episodes, only the ones that began in China and the Philippines in the second quarter of 2009 were still ongoing as of December 2010.

Table 2.1. Episodes of Large Net Private Capital Flows to Emerging Asia: Summary Statistics

	Emerging Asia	ASEAN-5	NIEs	China	India
Number of episodes	31	12	13	3	3
1989–1998	10	5	3	1	1
1999–2008	13	5	6	1	1
Current	8	2	4	1	1
Average size (in percent of GDP) ¹					
1989–1998	5.0	7.0	5.3	4.8	2.4
1999–2008	4.3	3.2	5.7	3.7	4.8
Current	4.3	2.3	7.9	3.5	5.0
Duration (in quarters)	7	9	5	20	23
1989–1998	25	30	10	20	23
1999–2008	6	7	5	22	23
Current	5	4	5	8	5

Sources: IMF, *Balance of Payment Statistics* and staff calculations.

¹ Market GDP-weighted average across episodes.

However, there is sizable cross-country variation. For the ASEAN-5 countries, net capital flows were substantially higher in the 1990s than at any time subsequently. This is because although portfolio debt flows have been sizable recently, FDI and banking flows have fallen substantially since the mid-1990s. In India, on the other hand, net capital flows have been on a secular rise since the capital account liberalization of 1991. The NIEs offer yet another variation, with net flows peaking after the global financial crisis. In China, the surges have gradually decreased over time, with the composition shifting from FDI to banking flows.

There are fewer signs of imbalances in Asian asset markets now than during previous capital inflow surges. Comparing the deviations from

long-term averages in early 2011 asset valuations with peak levels in previous episodes of large capital inflows suggests that (Table 2.2):²

- *Equities and bonds.* Across all economies in Asia, equity valuations (forward-looking price-earnings ratios) reached significantly higher peaks during the previous episodes of large capital inflows, particularly in the buildup to the Asian crisis. The picture is almost identical for bonds. Ten-year sovereign bond spreads were wider in early 2011 compared with the trough reached before the global financial crisis and at the eve of the crisis (2007:Q4; Figure 2.3).
- *Real estate markets.* There were strong signs of overheating in the buildup to the Asian crisis according to house price-to-rent indicators, with the possible exception of Indonesia.³ There were fewer such signs before the global financial crisis, except for price-to-rent ratios in Indonesia, Malaysia, and Taiwan Province of China. As of 2010:Q4, price-to-rent ratios appear relatively strong only in China and Hong Kong SAR.
- *Credit growth.* Most countries showed signs of excessive credit expansion during the capital inflows episodes of the 1990s. Although there were less signs of excessive credit growth before the global financial crisis, in late 2010 growth of credit to GDP ratios was particularly strong in a few regional economies including China, Hong Kong SAR, and Vietnam.
- *Corporate sector.* Firms have deleveraged markedly since the Asian crisis; before then, corporate debt-to-equity ratios were in the red or orange zone for all countries except for Taiwan Province of China.

² For methodologies, see Annex 1.9 of IMF (2010a).

³ Pre-Asian crisis data are not available for China, India, Malaysia, and Taiwan Province of China.

Table 2.2. Financial Indicators Across Episodes of Large Net Capital Flows to Emerging Asia

	Equity forward-looking price/earnings ratios ^{1,2}			Residential price/rent ratios ^{1,2,3}		
	Peak during the 1990s surge	Peak during the 2000s surge	Peak during the current episode	Peak during the 1990s surge	Peak during the 2000s surge	Peak during the current episode
China	24.0	32.8	14.2	...	100.0	118.8
Hong Kong SAR	15.8	21.1	17.2	170.3	126.6	144.5
India	23.6	21.7	17.5	...	103.1	91.9
Indonesia	22.2	15.6	14.4	106.6	108.9	100.9
Korea	20.7	12.3	12.2	121.8	101.0	99.5
Malaysia	27.2	17.1	15.5	...	106.0	101.8
Philippines	20.0	19.6	16.5	379.0	191.9	99.1
Singapore	27.2	22.6	14.3	171.2	130.4	117.3
Taiwan Province of China	33.2	23.9	29.4	...	120.8	112.7
Thailand	43.0	13.3	11.5	183.4	127.4	101.8
Growth of credit-to-GDP ratios ^{1,4}						
	Peak during the 1990s surge	Peak during the 2000s surge	Peak during the current episode	Peak during the 1990s surge	Peak during the 2000s surge	Peak during the current episode
China	10.6	10.5	24.3	66.7	61.6	43.7
Hong Kong SAR	25.9	12.2	19.1	38.1	30.8	19.7
India	1.4	5.4	4.1	155.2	85.2	72.9
Indonesia	16.8	3.7	2.0	190.4	106.3	41.7
Korea	24.9	20.4	16.2	264.1	81.8	67.3
Malaysia	24.9	9.4	21.3	59.3	45.7	33.6
Philippines	12.6	2.0	4.0	67.0	39.8	16.1
Singapore	11.8	21.0	10.9	44.5	36.8	28.2
Taiwan Province of China	16.9	8.3	1.7	46.2	56.3	28.4
Thailand	19.0	5.7	6.1	166.0	68.2	34.3
Vietnam	...	22.0	22.5	...	53.8	47.4

Sources: CEIC Data Company Ltd.; Haver Analytics; Thompson Reuters I/B/E/S database; Organization for Economic Co-operation and Development; Worldscope; and IMF, *International Financial Statistics* and staff estimates.

¹ Colors represent the extent of the deviation from long-term averages expressed in number of standard deviations (*z-scores*). Green denotes less than 1.5 standard deviations above long-term averages, orange between 1.5 and 2 standard deviations, and red greater than 2 standard deviations. For methodologies, see Annex 1.9 of IMF (2010a).

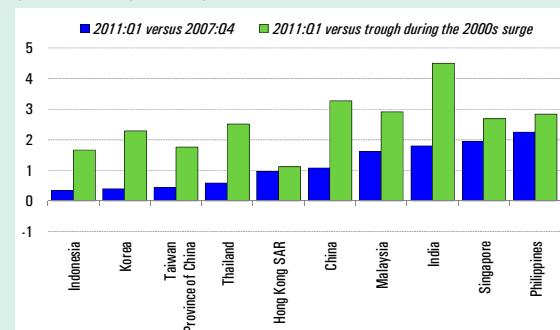
² For Indonesia, Korea, Malaysia, and Thailand, the period 1998–2000 is excluded in determining the peaks.

³ Indexes equal to 100 in 2002:Q3 for Taiwan Province of China and in 2008:Q4 for other economies.

⁴ Annual changes in credit-to-GDP ratios.

However, Asian economies are still at an early stage of the capital flow cycle, and concerns about the volatility of capital flows remain. Moreover, as suggested in Chapter I, the few signs of recent overheating pressures more likely reflect domestic imbalances than capital inflows, suggesting that imbalances often develop outside of capital inflow surges. A perennial concern of policymakers in emerging market countries is the volatility of capital flows, which, as noted in the April 2011 *World Economic Outlook*, has generally increased across time for all types of flows and regional groupings. Given the relatively shallow

Figure 2.3. Selected Asia: 10-year Bond Spreads¹
(In percent; difference between 2011:Q1 and troughs in previous episodes of large net capital flows)



Sources: CEIC Data Company Ltd.; Haver Analytics; and IMF staff estimates.

¹ Spreads over 10-year U.S. Treasury bond interest rate.

markets in some countries, this suggests that asset price bubbles can still form quickly, and that sudden stops remain a real possibility.

C. How Effective Is Monetary Policy in the Face of Large Capital Flows?

When confronting volatile and potentially destabilizing capital inflows, the first line of defense is macroeconomic policies, including both monetary and exchange rate policy, and fiscal policy. If the economy is overheating, with high or rising inflation or a developing credit or asset price boom, monetary policy should be tightened, although this can attract further inflows, to the extent that they are being driven by yield differentials. Greater exchange rate flexibility offers an important buffer against the risks posed by large capital inflows, as it can reduce the contribution to domestic demand overheating from large capital inflows; curb expectations of a large step appreciation and thus discourage further speculative inflows; and lessen the need for foreign exchange intervention and the resulting risk of excess liquidity and credit booms. Countercyclical fiscal policy also has an important role to play in weakening the impact of capital flows on the domestic cycle, reducing both appreciation and overheating pressures.

By depressing local long-term yields, however, the rapid resumption of capital flows to Asia after the global crisis has raised concerns about policymakers' ability to tighten monetary stances. Households and firms often base their decisions to consume or invest on long-term interest rates. However, central banks have relatively limited influence on longer-term rates, which are also influenced by global factors, term premiums, and inflation expectations.

Indeed, global interest rates have been a key driver of long-term bond yields in emerging Asia (Figure 2.4). To assess the relative importance of domestic versus foreign factors in determining long-term interest rates in Asia, two

methodologies are used in this chapter: a generalized dynamic factor model and a structural vector autoregression (SVAR) model (Appendix 2.1 for further details).⁴ The main results of the analysis are as follows:

- *A large proportion of the change in long-term yields in Asia over the last decade can be explained by global factors.* The estimated common factor model shows that about 40 percent of the variation in Asian bond yields on average over the last 10 years can be explained by a “common factor.” U.S. long-term interest rates and global risk aversion (measured by the VIX) explain a large share of the variation in this common factor (35 percent and 25 percent, respectively; Figure 2.5).
- *U.S. interest rates are a more important determinant of changes in Asia's long-term yields than short-term domestic interest rates.* The response of domestic long-term yields to shocks to U.S. yields and domestic policy rates is assessed within an SVAR model that also includes inflation expectations, exchange rate changes, global risk aversion, and GDP growth.⁵ The results suggest that, on average across Asia, about half of the variation in long-term yields can be attributed to shocks to U.S. long-term interest rates (Figure 2.6). For shorter-term yields (1 year), the contribution from U.S. interest rates is lower, and domestic variables matter more (Figure 2.7).

The contribution of U.S. interest rates to domestic bond yields varies noticeably across Asia. In particular, the contribution is smaller in countries that are less financially integrated and have relatively less open capital accounts, such as India and China. The contribution is higher in

⁴ The sample consists of eight Asian economies, namely, China, India, Indonesia, Korea, Malaysia, the Philippines, Taiwan Province of China, and Thailand. Hong Kong SAR and Singapore are excluded because their nominal anchor for monetary policy is not the interest rate, but the exchange rate.

⁵ The results presented here use the U.S. 10-year yield, as it correlates well with the common factor.

countries with a large foreign presence in domestic government bond markets (such as Indonesia and Malaysia). Indeed, the increasing foreign participation in Asian bond markets appears to explain to a larger extent the correlation between U.S. interest rates and Asian long-term yields (Box 2.1). Plotting the contributions to Asian bond yields from the U.S. interest rate (from the SVAR model) together with an index of capital account openness (as measured by the Chinn-Ito index; see Chinn and Ito, 2008) shows that countries that are more financially integrated tend to be more exposed to the U.S. interest rate cycle (Figure 2.8).

Notwithstanding the important role of long-term rates in monetary transmission in other parts of the world, the interest rate channel in Asia works mostly through short-term interest rates. A vector autoregression model shows that after 1 year, changes in 3-month interest rates account for about 25 percent of the average variation in output across Asian emerging economies, compared with about 5 percent explained by changes in 10-year rates (Figure 2.9).⁶ The relatively greater importance of short-term rates in Asia may be explained by bank loans to businesses in Asia being often priced in reference to interbank rates with short-term maturities, typically 3 months.⁷ Furthermore, for most countries in the sample, more than half of corporate debt is short term, and the bulk of mortgages is at variable rates and also priced in reference to short-term rates (Figure 2.10).⁸

Although still effective, the interest rate channel of transmission may be somewhat weaker in periods of large and volatile capital inflows. First, large inflows may lower the risk premium, blunting the impact of monetary tightening on lending rates. Second, if foreign capital is abundant, banks may choose not to raise lending

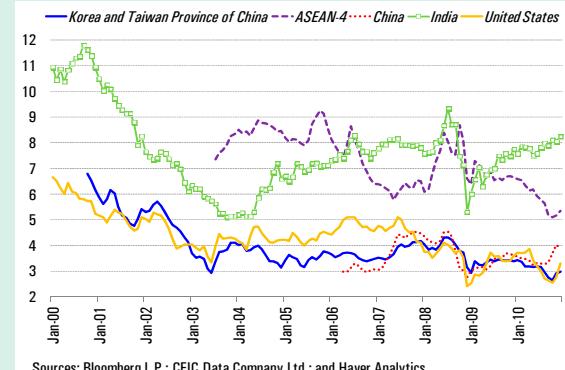
⁶ The remainder of the variation in output is explained by foreign demand, inflation expectations, and exchange rate changes.

⁷ See Garcia-Herrero and Remolona (2008).

⁸ See Mohanty and Turner (2008).

Figure 2.4. Secondary Market Yield of 10-Year Government Bond

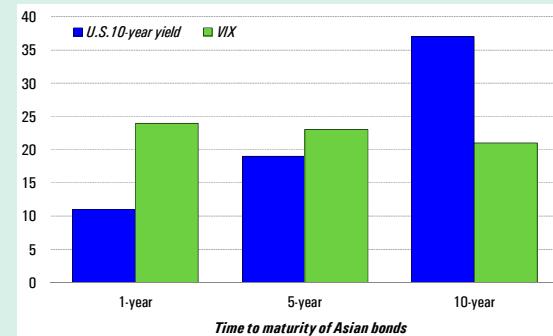
(In percent)



Sources: Bloomberg L.P.; CEIC Data Company Ltd.; and Haver Analytics.

Figure 2.5. Contributions of U.S. 10-Year Yield and VIX to the Common Factor of Asian Bond Yields¹

(In percent)

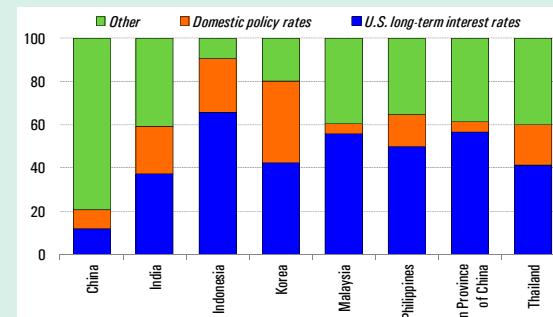


Source: IMF staff estimates.

¹ Variance decomposition of the common factor over 10-quarters.

Figure 2.6. Selected Asia: Variance Decomposition of Domestic 10-Year Yield by Sources during 2005–10

(In percent)



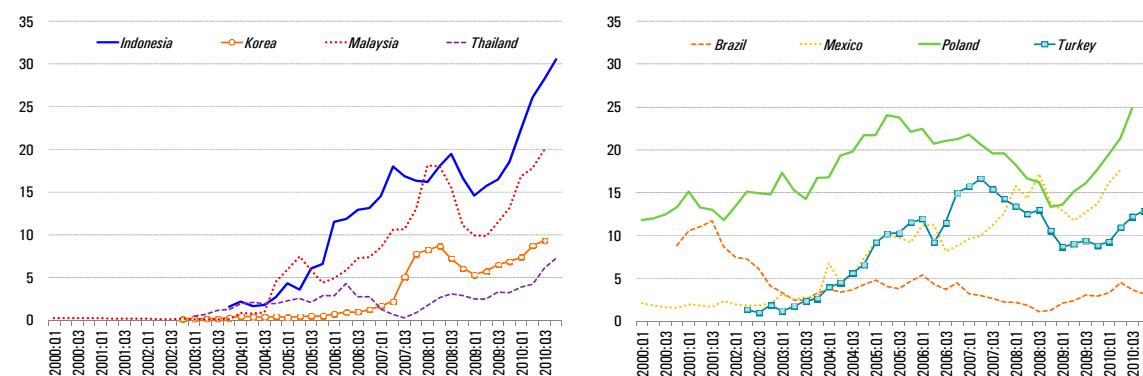
Source: IMF staff estimates.

Box 2.1. Do Nonresident Bond Holdings Affect Long-Term Interest Rates in Emerging Markets?

The surge of capital inflows to emerging market economies that began in mid-2009 has been characterized by a spike in nonresident investment in domestic bond markets. Nonresident investment in bond holdings has reached new peaks in Indonesia and Poland, and more than doubled in Korea, Malaysia, and Thailand (figure). However, even after the current surge in capital flows, nonresident investors still represent a minority share of emerging markets' bond markets.

In several emerging market economies, the sharp increase in nonresident bond holdings has been accompanied by a decline of long-term yields, raising questions on the strength of the monetary policy transmission mechanism in the presence of large capital inflows, as discussed in the text.

Emerging Markets: Nonresident Holdings of Domestic Government Bonds (In percent of total outstanding)



Sources: Country authorities; Asia Bonds Online; CEIC Data Company Ltd.; and IMF staff calculations.

To what extent was the decline in long-term yields in emerging markets related to the spike in nonresident investment in bonds market? There are two reasons why the two phenomena can be related. First, nonresident "real money" investors extended the maturity of their fixed income investments in emerging markets, relative to before the global crisis, attracted by the higher potential for gains at the longer end of the yield curve. Second, since domestic holders of long-term bonds typically hold them to maturity, even a small reallocation of foreign investment toward this segment of the market may be enough to bring down yields significantly.

Econometric analysis by IMF staff (Appendix 2.1) suggests that nonresident investment has contributed significantly to the observed decline in emerging market long-term yields. Each percentage point increase in foreign participation reduces long-term bond yields by about 5 basis points on average across emerging markets. This result is robust to changes in specification and estimation methods, and nearly identical to that in Peiris (2010). The results are also not significantly different for Asian economies compared with non-Asian emerging markets; nor is there a significant difference between economies that have a high or low share of nonresident investment. Finally, the results show that a 25 basis point increase in policy rates could offset the impact on long-term yields from a 2 percentage point increase in nonresident bond holdings. In other words, a modest tightening of the monetary policy stance could maintain long-term rates unchanged in the presence of moderate capital inflows.

Note: The main author of this box is Ceyda Oner.

rates when domestic monetary policy is tightened. To assess whether the pass-through from policy rates to market interest rates in Asia is different when an economy is facing large capital inflows, a fixed-effects panel model is estimated that regresses 3-month rates on policy rates and lags of both.⁹ Other factors that determine the pass-through from policy rates to market rates, such as the degree of competition within the banking sector, and financial market development and openness, are accounted for by including country-specific fixed effects in the model. The analysis finds that on average across Asian economies, the short-term pass-through coefficients decline from about 0.5 to 0.3 in periods of large capital inflows, whereas the long-term pass-through coefficients decline from 0.9 to 0.6 (Figure 2.11).

D. What Role Can Macroprudential Measures Play?

When capital inflows are large, conventional monetary policy still has a role to play in counteracting overheating pressures but it may not be sufficient to guard against the risks of financial instability. Indeed, the global financial crisis has shown that macroeconomic stability is not sufficient to ensure financial stability. Financial imbalances built up in advanced economies notwithstanding stable growth and low inflation. Prudential regulation and supervision, with its focus on individual firms, provided no guarantee that systemwide risks could be contained. In this context, there have been increased calls for the development of macroprudential measures globally, with an explicit focus on systemwide financial risks (Bank for International Settlements (BIS), 2010; Ostry and others, 2011).

⁹ This is in line with the model specification presented in IMF (2010b), although estimated as a panel rather than country by country, owing to lack of sufficient capital inflow episodes for certain countries. Robust standard errors are used to gauge statistical significance.

Figure 2.7. Selected Asia: Contribution of U.S. Long-Term Interest Rates to Variance of Domestic Yields by Maturity (In percent)

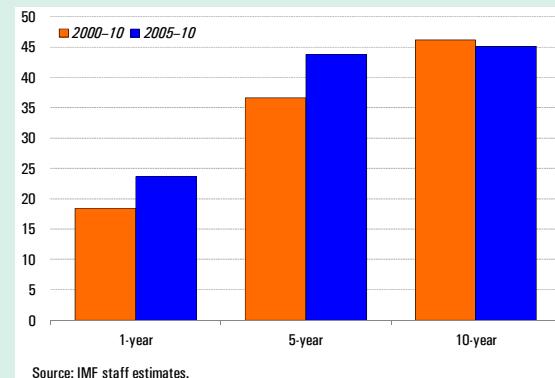


Figure 2.8. Selected Asia: Importance of U.S. Interest Rates and Capital Account Openness

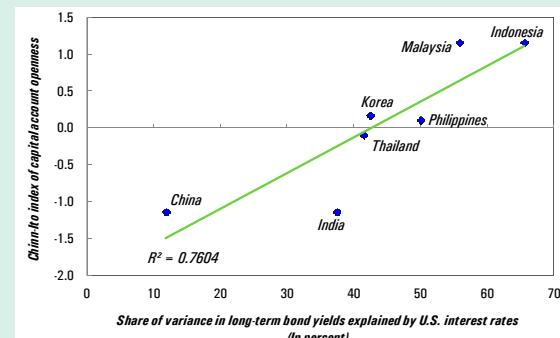


Figure 2.9. Selected Asia: Variance Decomposition of Industrial Production in Response to Shocks to Domestic Interest Rates (In percentage points; 12th month after shocks)

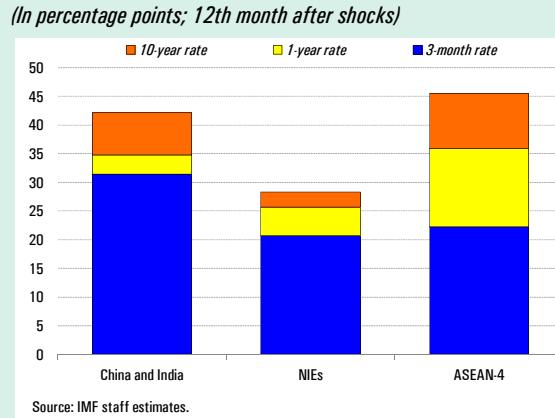


Figure 2.10. Selected Asia: Short-Term Corporate Debt
(Average over 2000–09; in percent of total debt)

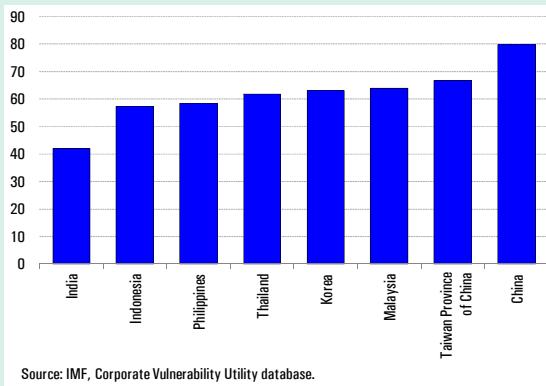
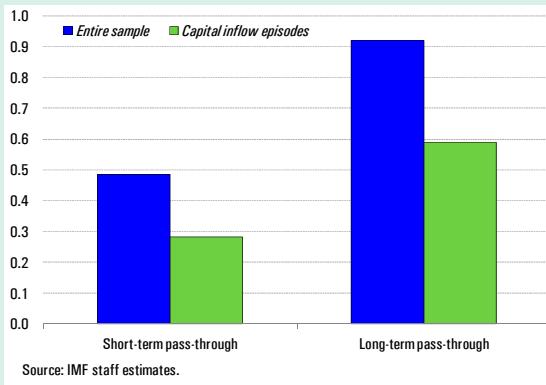


Figure 2.11. Selected Asia: Effect of Capital Flows on Monetary Transmission Mechanism
(Pass-through from policy rates to lending rates)



Macroprudential measures are designed to increase the resilience of the financial system to credit or asset valuation boom-bust cycles. They are defined as regulatory policies that aim to reduce systemic risks, ensure stability of the financial system as a whole against domestic or external shocks, and ensure that it continues to function effectively (BIS, 2010). During boom periods, perceived risk declines, asset prices increase, and lending and leverage become mutually reinforcing. Conversely, during a bust phase, a vicious spiral can arise between deleveraging, asset sales, and the real economy. Given Asia's past experience with these cycles, macroprudential measures could be particularly useful in reducing the procyclicality of financial systems and, therefore, the amplitude of business

cycles.¹⁰ Indeed, several economies, in Asia and elsewhere, strengthened macroprudential regulations during 2010 in an effort to minimize risks associated with large capital inflows (see Box 2.2 for details of a recent IMF survey).¹¹

Macroprudential measures differ from traditional monetary policy in some key respects. Changes in both policy rates and macroprudential measures are likely to affect aggregate demand and supply as well as financial conditions. However, the two instruments are not perfect substitutes and can usefully complement each other, especially in the presence of large capital inflows that tend to increase vulnerabilities of the financial system:

- First, changes in policy rates are “blunt” instruments, as they impact all lending activities regardless of whether they represent a risk to the economy (Ostry and others, 2010). The increase in interest rates required to induce specific sectors to deleverage might be so large as to amplify aggregate economic volatility. By contrast, macroprudential measures are aimed specifically at markets in which the risk of financial instability is deemed to be excessive (BIS, 2008; Ingves, 2011).
- Second, in economies with open financial accounts, increases in the interest rate may have only a limited impact on credit expansion if firms can borrow at a lower rate abroad. Moreover, although monetary transmission works well through the asset price channel in “normal” times, in “abnormal” times sizable rapid changes in risk premiums could offset or diminish the impact

¹⁰ See Craig, Davis, and Pascual (2006) for evidence on the procyclicality of Asian financial markets.

¹¹ An environment of low interest rates may also foster greater risk appetite among financial intermediaries and investors and thus contribute to the buildup of imbalances. See Borio and Zhu (2008), Altunbas, Gambacorta, and Marqués-Ibàñez (2010), and Jimenez and others (2010).

Box 2.2. Macroprudential Policy—An International Perspective

A recent survey conducted by the IMF shows that “macroprudential policy” is becoming an important element of economic policy making.¹ Macroprudential policy is intended to limit the buildup of systemic risk in the financial sector that may arise from either domestic imbalances or external shocks. The survey finds that Asia has had extensive experiences with the implementation of macroprudential policy.

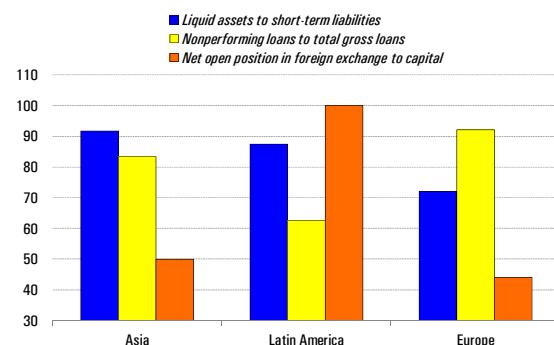
A key responsibility of the macroprudential policy is to identify and monitor various risks that may have a systemic impact. According to the survey, a large array of indicators is used in that regard. In Asia and Europe, many country authorities are concerned with credit risk, and monitor quite closely the ratio of nonperforming loans to total loans (figure). Reflecting the structure of balance sheets, in Latin America, respondents tend to be more worried about currency risk and frequently monitor the net open currency position to capital. Emerging markets generally tend to track credit risk more than advanced countries, where the focus is on leverage.

Authorities have used a large toolkit to address the various risks given the wide policy perimeter they assign to macroprudential policy. A total of 30 different instruments is cited, some of which extend beyond traditional prudential tools. Increasing government-owned land sales to boost land supply, for example, is cited by Singapore as an instrument to prevent house price bubbles. While some of the instruments have been in use since the early 1990s, more countries have started to deploy and/or made adjustment to their instruments since the global crisis, a clear indication that such instruments are gaining importance as the macroprudential policy framework evolves. The most widely used instruments include caps on the loan-to-value ratio and limits on net open currency positions, but there are regional variations (figure).

For many emerging market economies, a frequently cited macroprudential policy objective is to address the impact of large capital inflows on the financial system. Asian countries often implement measures that are aimed at credit growth and the associated asset price inflation. Of the six countries that have total or sector-specific credit limits, three are in Asia (China, Malaysia, and Singapore), compared with one each in Latin America and Europe (figure). In contrast, Latin American countries tend to apply measures that target

Use of Indicators by Region

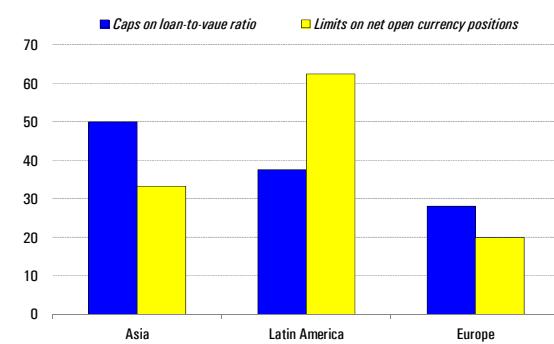
(Percent of respondents)



Source: IMF survey, December 2010.

Use of Instruments by Region

(Percent of respondents)



Source: IMF survey, December 2010.

Note: The main authors of this box are Cheng Hoon Lim, Xiaoyong Wu, and Akira Otani (of the IMF Monetary and Capital Markets Department).

¹ The survey was conducted in December 2010. It was sent to 63 countries and the European Central Bank, including all countries in the G–20. The response rate was close to 80 percent, of which 24 percent (12 countries) were from Asia (see IMF, 2011a).

Box 2.2. (concluded)

nonresidents, that is, capital controls.² These include unremunerated reserve requirements for nonresidents, taxation of capital flows, and minimum holding periods for capital inflows. Of the eight countries that have implemented capital controls, seven are in Latin America, compared with one in Asia (Thailand). European countries tend to focus on the currency risk aspect, and often impose caps on foreign currency lending.

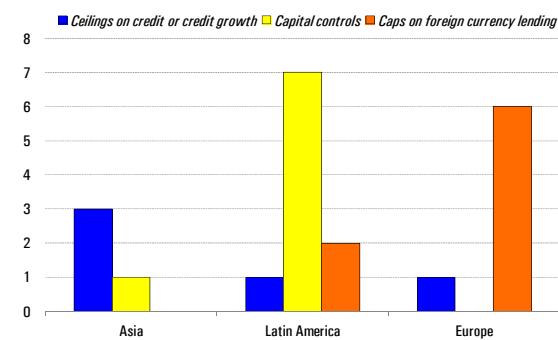
² The IMF, the Financial Stability Board, and the Bank for International Settlements do not consider capital controls to be part of the macroprudential toolkit.

of policy rate changes on credit growth and asset prices (Kohn, 2008; Bank of England, 2009).

- Third, interest rate movements aimed at ensuring financial stability could be inconsistent with those required to achieve macroeconomic stability, and this inconsistency could risk destabilizing inflation expectations (Borio and Lowe, 2002; Mishkin, 2007). For example, under an inflation-targeting framework, if the inflation outlook is within the target, a response to asset market fluctuations to maintain financial stability may damage the credibility of the policy framework.

The tradeoffs and complementarities between monetary policy and macroprudential measures are analyzed in an open-economy, New Keynesian macroeconomic model (see Appendix 2.2 for details). In the model, firms can finance their investment through retained earnings or borrowing from domestic or foreign sources.¹²

¹² The analysis adds an open economy dimension to several studies that have incorporated macroprudential instruments into general equilibrium models, such as Angeloni and Faia (2009), Kannan, Rabanal, and Scott (2009), N'Diaye (2009), and Angeloni, Faia, and Lo Duca (2010).

Use of Instruments by Region*(Number of respondents)*

Source: IMF survey, December 2010.

Macroprudential policy entails higher costs for financial intermediaries that are likely to be passed on to borrowers. Hence, in the model, macroprudential measures are defined as an additional “regulation premium” to the cost of borrowing, rises with credit growth.¹³ This is meant to capture the notion that such measures make it harder for firms to borrow during boom times, and therefore make a subsequent bust less dramatic. Monetary policy is assumed to follow a Taylor rule, with the central bank reacting to changes in inflation and output gaps.

The analysis allows an assessment of alternative monetary and macroprudential responses to capital inflow surges. The initial shock is modeled as a decline in investors’ perception of risk, and it plays out through the familiar financial accelerator mechanism. As financing costs decline, firms borrow and invest more. Stronger final demand and higher asset prices boost firms’ balance sheets and reduce the risk premium further. As capital inflows surge, the currency appreciates, which helps limit overheating and inflation pressures.

¹³ The chapter does not analyze any particular form of macroprudential measures, but rather focuses on a generic case where macroprudential measures lead to additional costs to financial intermediaries, which are then reflected in higher interest rates for borrowers.

Eventually, higher leverage triggers an increase in risk premium, and financial conditions normalize. But both monetary and macroprudential policies have a nontrivial role in mitigating the impact of the shock.

The simulations suggest that macroprudential measures could be a useful complement to, but not a substitute for, monetary policy in stabilizing the economy. Figure 2.12 shows the response to an unanticipated 1 percent reduction of perceived risk, which results in an increase in capital flows of about 0.1 percent of output.¹⁴ Three different policy responses are compared, with the parameters of the policy rules and their stabilization properties presented in Tables 2.3 and 2.4, respectively.

- In the first—baseline—scenario (Taylor rule only), policy rates are increased in response to higher output and inflation gaps. The higher policy rates partially offset the impact of the lower risk premium on lending rates, and stabilize output as investment and consumption become more costly. The stabilization of demand helps to reduce inflation, whereas the welfare loss is estimated at about 2½ percent of steady state consumption.
- In the second scenario (Taylor rule and macroprudential measures), policymakers also adopt macroprudential measures that directly counteract the easing of the lending standards and thus the financial accelerator effect. Indeed, both domestic debt and foreign debt increase less than in the first scenario, and the increase in asset prices is also lower. The responses of output and inflation are therefore more muted, and the welfare loss after the shock decreases by more than half, compared with the simple Taylor rule.

¹⁴ The parameters of the model are calibrated to capture several important features of emerging Asia, including trade openness, leverage of firms, and the risk premium.

- In the third scenario (optimized Taylor rule and macroprudential regulation), the parameters of the Taylor rule and macroprudential responses are optimized so as to minimize the variation in inflation and output gap after the shock. Hence, the policy response in this case is most successful in stabilizing the economy and reducing welfare loss. This optimal response involves a tighter monetary policy stance, as the inflation term has a higher weight in the optimized Taylor rule (2.4) than in the previous two cases (1.5). But there is also room for macroprudential measures: indeed, the weight on nominal credit growth in the macroprudential rule is higher (1.3) than under the second scenario (0.5).

Table 2.3. Parameters of the Policy Rules

	Monetary policy rule		Macroprudential rule	
	Lagged interest rate	Inflation	Output gap	Nominal credit
Taylor rule	0.5	1.5	0.5	0.0
Taylor rule and macroprudential rule	0.5	1.5	0.5	0.5
Optimized Taylor rule and macroprudential rule	0.0	2.4	0.8	1.3
Macroprudential rule without monetary response	0.0	0.0	0.0	2.5

Source: IMF staff estimates.

Table 2.4. Performance of Policies in Reaction to a Financial Shock

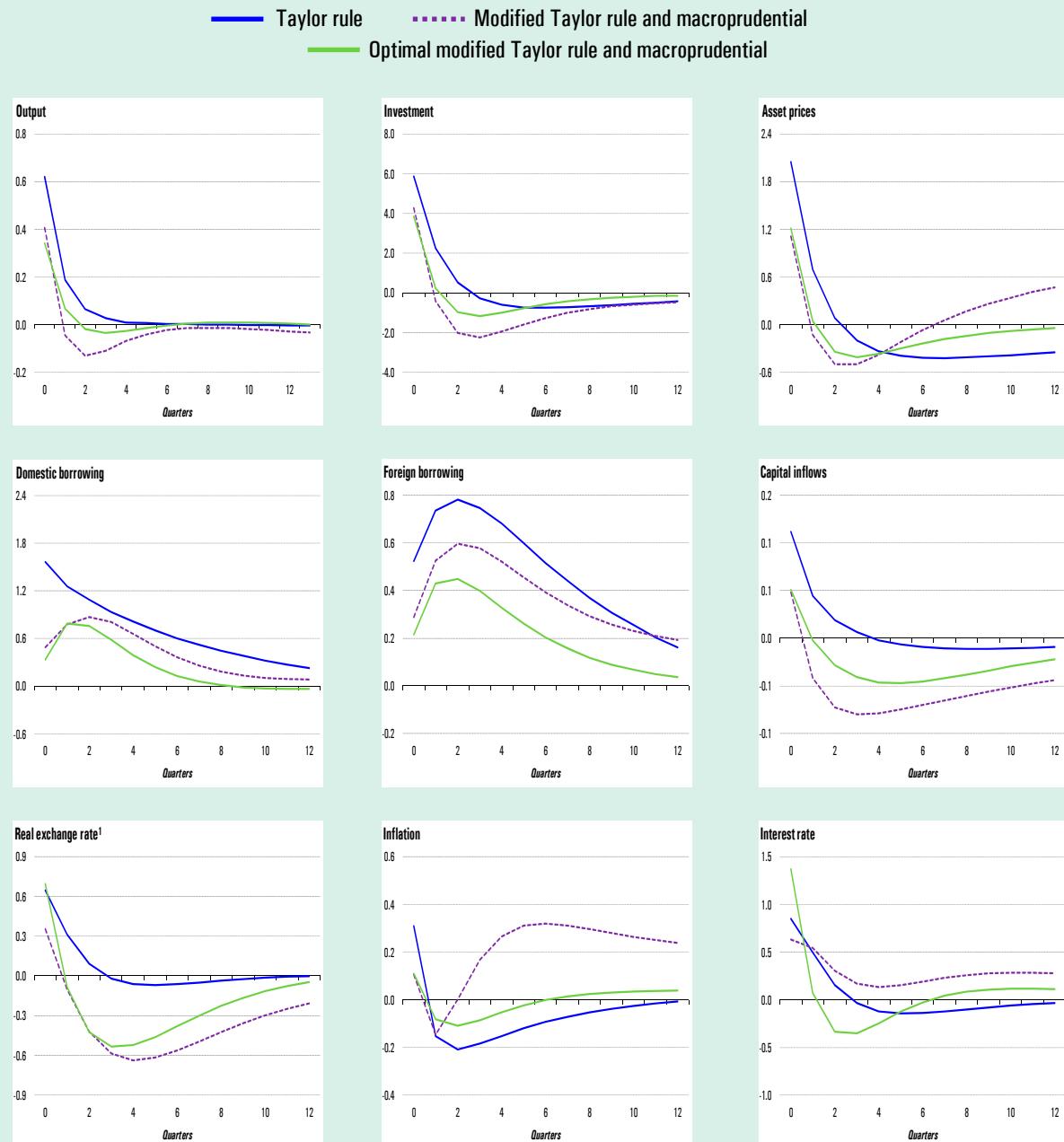
	Consumer prices (standard deviations)	Output gap (standard deviations)	Welfare loss ¹ (in percent)
Taylor rule	0.03	0.15	2.46
Taylor rule and macroprudential rule	0.05	0.12	1.25
Optimized Taylor rule and macroprudential rule	0.00	0.02	0.02
Macroprudential rule without monetary response	0.19	0.53	31.50

Source: IMF staff estimates.

¹ Welfare loss is calculated as the sum of the volatility of inflation and output gaps, multiplied by 100 so that the results indicate welfare losses as a percent of steady-state consumption.

REGIONAL ECONOMIC OUTLOOK: ASIA AND PACIFIC

Figure 2.12. Selected Asia: Responses to a Financial Shock
(Deviation from steady-state; in percent)



Source: IMF staff estimates.

¹ An increase in real exchange rate implies appreciation.

To illustrate that macroprudential measures alone are not a sufficient response and are not a substitute for monetary policy, we model a policy regime with macroprudential regulation while maintaining policy rates unchanged. Under this scenario, the regulation premium is calibrated to replicate the path of the lending rate under the baseline (Taylor rule) scenario, to reflect policymakers' objective of achieving the same increase in the lending rate through macroprudential measures only. This policy would constraint firms' borrowing and investment, but not consumption, as it would leave interest rates constant. Demand and inflation would thus be higher than in the other policy regimes, and the welfare loss would be excessively large. The size of the required macroprudential measure is likely to be too far reaching, significantly constraining the financial sector and damaging productive investment and potential growth.

As noted in Chapter I, it is too early to assess the effectiveness of the macroprudential measures adopted in many emerging Asian economies over the past few quarters. Using the IMF's *Annual Report on Exchange Arrangement and Exchange Restrictions* (AREAER), however, it is possible to identify similar measures that were adopted in the past (since the mid-1990s), and to assess where they have been associated with changes in capital flows and key financial variables. To do this, measures in the AREAER database have been classified across three categories: (i) foreign exchange-related measures (aimed at reducing banks' foreign currency exposure, including, for example, higher reserve requirement on foreign currency deposits); (ii) housing market-related measures (including lower loan-to-value ratios); (iii) other measures taken to address financial stability concerns and that did not discriminate between domestic and foreign residents. The result suggests that foreign exchange-related and other measures have been generally associated with some moderation in net capital inflows, although only the latter with statistical significance (Table 2.5). The adoption of housing-related measures has been followed by lower residential price-to-rent ratios.

Table 2.5. Selected Asia: Impact of Macroprudential Measures¹

	FX-related prudential measures	Housing market prudential measures	Other prudential measures
Net private capital inflows (in percent of GDP)	-1.3 (4)		-1.9 * (5)
Portfolio investment	-0.6 (1)		-1.2 * (4)
Bank loans/other investment	-1.8 (4)		-1.7 * (5)
Index of residential price/rent ratios (in percent)		-11.5 * (4)	

Sources: IMF, *Annual Report on Exchange Arrangements and Exchange Restrictions* (AREAER), *International Financial Statistics*, and staff estimates.

¹ The impact of each measure is assessed within six quarters following its introduction. A standard one-sided *t*-test is used to assess whether financial indicators are significantly different after the introduction of the measures relative to the same number of quarters before. The table reports the impact during the first quarter the policy is effective, or—for measures not statistically significant—most effective (the number in brackets). An asterisk mark denotes statistical significance at 10 percent level.

E. Conclusions

Net capital flows to emerging Asia have surged after the global crisis but not reached previous peaks, and there are only isolated signs of pressures thus far, but policymakers should remain focused on potential risks to the real economy and financial stability from capital inflow surges. There is significant variation across countries in both the magnitudes and types of inflows experienced so far. Signs of risks from asset valuations and corporate indicators remain largely muted, and external buffers are large. Nevertheless, there are isolated pockets of concern, such as credit dynamics in some countries and certain segments of property markets around the region. Despite the fact that the current capital flow cycle is only a few quarters old, the strong pace of the surge until late 2010 and the continuing volatile nature of capital flows warrant special attention.

Even in periods of large capital inflows, monetary policy in Asia remains effective at macroeconomic stabilization. In addition, other complementary tools can be useful at times in helping to achieve the twin objectives of macroeconomic and financial stability. In particular:

- Although long-term interest rates in Asia are predominantly determined by global factors, the interest rate channel of the monetary transmission mechanism remains powerful, as it works mainly through short-term interest rates.

- Macroprudential measures have a useful role to play in addressing the risks of macrofinancial instability from capital inflow surges. However, these measures are not a substitute for tighter monetary policy.

Appendix 2.1. Econometric Methods: Global Dynamic Factor Model, Structural VAR, and Panel Regression

The Global Dynamic Factor Model (GDFM) provides an estimation of the unobserved common factor among a given set of sample elements, following Forni and others (2005). A vector of time series for each country is represented as the sum of two mutually orthogonal components: a common component and an idiosyncratic component. The common component here would correspond to the variation in yields that is not directly linked to the specific macroeconomic characteristics of the country but to developments in the global economic and financial system. Next, the determinants of this common component are analyzed, including the VIX, foreign interest rates, and the slope of the U.S. yield curve as a proxy for foreign growth prospects.

A structural VAR (SVAR) is first used to estimate the relationship between the domestic long-term interest rate, domestic policy rate, and foreign interest rates.¹⁵ The SVAR includes a number of variables that influence the dynamics of interest rates, including the VIX (assumed to be exogenous), expected changes in exchange rates, changes in capital flows, growth differentials, and inflation expectations.¹⁶ Data are from January 2000 to November 2010 and are first differenced to ensure stationarity. The lags are chosen using the standard information criterion.

The SVAR is identified using the Choleski decomposition of the variance-covariance matrix of the residuals. The ordering of the model follows other papers in the literature, including Christiano, Eichenbaum, and Evans (1996) and Kim (1999). The identifying assumption is that output reacts more slowly than financial variables and is contemporaneously more exogenous. In the ordering, output is followed by inflation expectations, interest rates, and exchange rates. The policy rate is assumed to be contemporaneously more exogenous than market rates, because the latter are assumed to react to the policy rate.

The robustness of the results is tested in various ways. First, using generalized impulses also yields the result that long-term yields in Asia are driven to a greater extent by foreign interest rates. Second, the results are based on the U.S. 10-year yield, which correlates well with the common factor. However, a robustness check using a global interest rate (average of the United States, the European Union, and Japan) does not change the nature of the findings.

A second set of VARs is used to assess the relationship between output and interest rates across the yield curve in Asia, similar to Christiano, Eichenbaum, and Evans (1996) and Lange (2005). In particular, the responses of output to shocks in interest rates of different maturities are examined. The variables in the model include 3-month (proxy for short-term rate), 1-year, and 10-year government bond yields, industrial production (measure of output), inflation expectations, exchange rate changes, and foreign demand. The variables in the VAR are ordered so that output is assumed to be contemporaneously the most exogenous (as above), whereas interest rates are considered more endogenous as they react more rapidly to changes in nominal variables. To identify the VAR, we assume that interest rates are ordered in terms of maturity (Lange, 2005), so that the yields of shorter maturity affect the longer-term yields contemporaneously. The relative importance of shocks to different interest rates for aggregate demand is shown by the forecast error variance decompositions.

¹⁵ Previous work on a large set of Asian and non-Asian emerging market countries using VARs has found that foreign interest rates have a larger impact on domestic long-term rates than does the domestic policy rate (see Moreno, 2008).

¹⁶ Expected exchange rate changes are based on consensus forecasts of exchange rate movements.

To analyze the impact of nonresident investment on long-term yields, a fixed-effects panel model is estimated for eight emerging markets over 2000:Q1–2010:Q4. This analysis follows the specification similar to Warnock and Warnock (2009), which explored the impact of nonresident purchases of U.S. Treasury bonds on their yields.¹⁷ The specification estimated is as follows:

$$i_{i,t}^{LT} = c + \alpha_i + \beta_1 i_{i,t}^{ST} + \beta_2 \pi_{i,t}^e + \beta_3 x_{i,t}^e + \beta_4 \rho_t + \beta_5 f_{i,t} + \beta_6 y_{i,t}^e + \beta_7 B_{i,t} + \varepsilon_{i,t} \quad (1)$$

where for country i , $i_{i,t}^{LT}$ is the long-term government bond yield, $i_{i,t}^{ST}$ is the short-term interest rate, π_t^e is the 12-month ahead inflation expectations, $x_{i,t}^e$ is the expected change in the exchange rate vis-à-vis the U.S. dollar over the next 12 months, $f_{i,t}$ is the fiscal balance, ρ_t is a measure of the risk premium on the long-term bond, y_t^e is the one-year ahead expected output gap, and B_t is the foreign holdings of bonds in percent of total outstanding.

Appendix 2.2. DSGE Model

Model simulations are based on a fully articulated structural model. Specifically, an open economy New Keynesian dynamic stochastic general equilibrium (DSGE) model with nominal rigidities is augmented with a financial accelerator mechanism after Bernanke, Gertler, and Gilchrist (1999). While the nominal rigidities (which include sticky prices) motivate a role for active monetary policy, features such as imperfect exchange rate pass-through and foreign currency-denominated borrowing are included to better capture the economic challenges confronted by emerging market economies. The model builds on the work of Elekdag and Tchakarov (2007), Gertler, Gilchrist, and Natalucci (2007), Kannan, Rabanal, and Scott (2009), and particularly Ozkan and Unsal (2010).

There are four sectors in the model economy. Households receive utility from consumption,

¹⁷ The sample consists of Brazil, Indonesia, Korea, Malaysia, Mexico, Poland, Thailand, and Turkey. See Pradhan and others (2011) for details.

provide labor to production firms, and participate in domestic and international financial markets. The households also own the firms in the economy, and therefore receive profits from these firms. Final goods producers produce a differentiated final consumption good using both capital and labor as inputs. These firms engage in local currency pricing and face price adjustment costs, resulting in sticky local currency final goods prices. Similarly, importers also face price adjustment costs and have some market power. Finally, intermediate producers combine investment with rented capital to produce unfinished capital goods that are then sold to corporations.

The corporate sector plays a key role in the model—its decisions determine the production of capital. To finance their capital investments, corporations partially use internal funds. However, they also require external financing, which is more costly than internal funds. The spread between the cost of external and internal financing is defined as “the risk premium,” and links the terms of credit with condition of the corporate balance sheet. Corporations are able to borrow from both local and foreign sources, and are indifferent between the two in the absence of cost differences.

In the model, macroprudential regulations entail higher costs for financial intermediaries, which are then reflected in lending rates. The spread between the lending rate and the policy rate is affected by the risk premium, discussed above, and “the regulation premium,” which is a function of nominal credit growth. Specifically, three factors affect the lending rate, R_t^L , and take the following form:

$$R_t^L = R_t^P \psi \left(\frac{D_t^P}{N_t} \right) R_P t . \quad (2)$$

- The first factor is the monetary policy rate, R_t^P , which evolves according to a Taylor-type rule:

$$R_t^P = (R_{t-1}^P)^\alpha [(1 + R_{ss}) (\pi_t / \pi_{ss})^{\gamma \pi} (Y_t / Y_{ss})^{\gamma Y}]^{1-\alpha}, \quad (3)$$

where R_{ss} is the steady-state level of the policy rate, π_t and π_{ss} are current and steady-state levels of inflation, Y_t and Y_{ss} are the current and

steady-state levels of output (in logs), respectively.

- The second factor is the risk premium, $\psi(\cdot)$, which is an increasing function of leverage, (D_t^D/N_t) , satisfying the conditions $\psi' > 0$ and $\psi'' > 0$, where D_t^D denotes the real level of debt or credit (the sum of both local and foreign

borrowing), and N_t is the net worth of the borrower.¹⁸

- The third factor affecting lending rates is the regulation premium, RP_t . Following Kannan, Rabanal, and Scott (2009) RP_t is a function of nominal credit growth such that:

$$RP_t = \rho \left[\frac{D_t^D P_t}{D_{t-1}^D P_{t-1}} - 1 \right]^{19} \quad (4)$$

¹⁸ In the case of foreign-denominated debt, the leverage would be a function of the nominal exchange rate as well. Following Aysun and Honig (2010), we allow both foreign and domestic borrowing. Liability dollarization, in this case, is endogenous, in contrast to the existing literature.

¹⁹ See Borio and Drehmann (2009), Borgy, Clerc, and Renne (2009), and Gerdesmeier, Roffia, and Reimers (2009) for a specific emphasis on the potential of nominal credit growth as a regulation tool.

III. IMPLICATIONS OF ASIA'S REGIONAL SUPPLY CHAIN FOR REBALANCING GROWTH

A. Introduction

Persistent global imbalances are raising concerns about the long-term sustainability of strong growth in Asia and across the world. Although current account imbalances in key countries declined in 2010, global imbalances are set to widen again over the medium term, as highlighted in the April 2011 *World Economic Outlook*. A sustained strengthening of private domestic demand will be needed for Asia to contribute to the resolution of global demand imbalances. Greater flexibility of real effective exchange rates would be an important part of the package of measures that would help to reduce large external surpluses.

The role of exchange rates and shifts in demand in global rebalancing cannot be fully understood without taking into account the increasing role of vertical integration in Asia's trade.¹ Much of the debate over rebalancing growth has been focused on the U.S.-China trade imbalance, and on the role of bilateral exchange rate realignments in resolving this imbalance. However, gross exports can overstate China's exposure to U.S. demand as they also reflect U.S. demand for intermediate goods of other Asian economies, whose exports to China are used as inputs for Chinese exports to the United States. Moreover, the importance of imported intermediate goods in the production of exports implies that the price competitiveness of exporters depends not only on their own currency but also on the currencies of their suppliers. A depreciation of supplier currencies, for example, would mitigate the loss of competitiveness from a real exchange rate appreciation in the home country. Separately,

Note: The main authors of this chapter are Adil Mohommad, Olaf Unteroberdoerster, and Jade Vichyanond.

¹ Vertical integration refers to the geographic dispersion of production processes across countries and international trade in intermediate goods (as opposed to final goods).

understanding Asian supply networks can also help assess the impact of disruptions to production in one country, as in Japan after the March 2011 earthquake and tsunami, on the rest of the region.

Against this background, this chapter focuses on two main questions:

- How are Asian economies linked through vertical integration, and to what extent do they compete in third markets?
- How do vertical linkages, on the one hand, and competition on third markets, on the other, affect the role that exchange rates and shifts in global demand can play in reducing external imbalances?

The analysis proceeds in three steps. Section B of the chapter describes the most salient features of Asia's emergence as the world's leading exporter. Section C discusses the nature of bilateral trade links in the region and of deeper vertical integration. Section D focuses on the potential implications of vertical trade integration in Asia for the effect of exchange rates and shifts in global demand on export competitiveness and external surpluses.

The main findings can be summarized as follows. Over the last decade, Asian economies have become part of a greater supply network, increasingly centered on China.² Not only has China relied intensively on imported inputs from the region, in particular from Japan and Korea, but the rest of Asia has also increasingly relied on inputs from

² In documenting these trends, this chapter builds on work in previous IMF *Regional Economic Outlooks*. IMF (2007a) focuses on intraregional trade networks in Asia; IMF (2008) proposes measures for assessing indirect trade exposures that are masked by vertical integration; and Mohommad, N'Diaye, and Unteroberdoerster (2011) uses Asian input-output analysis to derive measures of export dependence based on value added.

China. Nevertheless, sustained disruptions to production in Japan could also affect regional supply chains. As a result of growing vertical integration, the competitiveness of Asian economies depends not only on movements of their own currency, but also of the currencies of their suppliers. In other words, the price of exports to the final market (for example, the United States) will rise by more if the exchange rates of both the final exporter and its suppliers appreciate (*vis-à-vis* the currency of the final market) than if the exchange rate of only the final exporter appreciates. Moreover, in the presence of vertical integration, China's share of Asia's surplus *vis-à-vis* the United States is smaller than suggested by balance-of-payments data, which do not account for Asia's intermediate exports that are embedded in China's exports to the United States. Hence, it is misleading to focus on bilateral imbalances, as effective rebalancing will involve all major Asian economies.

B. Asian Exporters: Between Partnership and Competition

Asia is the world's leading source of exports, but the most striking trend is the rapid growth in intraregional trade.³ While global trade and Asia's trade with economies outside the region have doubled since 2000, intra-Asian trade has tripled, and regional trade involving emerging Asia, in particular, has increased even faster. As a result, Asian economies accounted for 35 percent of world exports in 2009, compared with 25 percent 10 years earlier, with the share of intraregional exports rising to 55 percent from 45 percent over the same period (Figure 3.1).

Intermediate goods exports have accounted for about 70 percent of the annual export growth in Asia over the last decade—more than double the contribution of capital and consumer goods

together.⁴ This has been particularly the case for the ASEAN-5, the NIEs, and Japan (Figure 3.2). Exports of intermediate goods have been particularly strong to other Asian economies, whereas consumer goods and intermediate goods have contributed roughly equally to the increase of exports outside Asia. As a result, intraregional exports are more intensive in intermediate goods than are other exports. The average share of intermediate goods exports between Asian trading partners has increased to nearly 80 percent in 2009 from about 60 percent a decade earlier (Figure 3.3).

Asian economies increasingly have formed a supply network, with China taking the role of an assembly hub for final goods exports, notably consumer goods. In this “triangular trading pattern” (Gaulier, Lemoine, and Ünal-Kensenci, 2005), direct export competition has been accompanied by trade partnerships. For Asia, excluding China, the share of intermediate goods exports to China in total exports has doubled over the last decade, whereas the share of direct consumer goods exports to the United States and euro area has steadily declined (Figure 3.4). A corollary of this development is the ongoing shift of market share in leading export markets toward China. For instance, while Asia's share in U.S. consumer goods imports has remained stable over the last two decades at about 40 percent, China's share has risen nearly threefold, from 9 percent to more than 25 percent, whereas shares of other Asian exporters, particularly Japan and the ASEAN-4 among emerging Asian economies, have declined (Figure 3.5).

As a result, competition in intermediate goods markets has become more important for Asian economies' overall exports than competition at the final goods level. To assess the intensity of competition in a simple way, we use an export similarity index (Appendix 3.1). The closer that

³Throughout this chapter, unless otherwise mentioned, “Asia” is defined as comprising the ASEAN-4 (Indonesia, Malaysia, Philippines, and Thailand), Australia, China, India, Japan, New Zealand, and NIEs (Hong Kong SAR, Korea, Singapore, and Taiwan Province of China).

⁴The definition of consumer goods, capital goods, and intermediate goods is based on the broad economic categories (BEC) classification in the United Nations, Comtrade database. Intermediate goods range from raw materials, such as primary industrial commodity supplies (food, nonfood, and fuels) to processed industrial supplies, parts, and accessories.

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index is to 100, the more similar is the export structure between two Asian economies and thus the higher is the degree of potential competition between them. The results suggest, as one might expect, that the degree of export competition is generally higher for countries at comparable levels of development. This holds across all major product categories, that is, consumer, capital, and intermediate goods exports (Figure 3.6 on capital goods, for example).

Moreover, competition appears to have increased over time, broadly in line with patterns of economic convergence across Asia. For example, in the case of capital goods, only five country pairs had an index of more than 80 in 1998–2002, compared with nine pairs in 2005–09. According to this metric, competition in capital goods exports was initially relatively stronger between Japan and Korea and between China and the ASEAN-5, but has since become stronger also between both Japan and China, and the NIEs and China.⁵

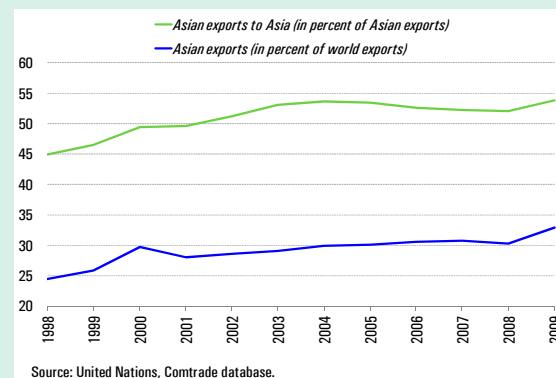
C. Evolving Trade Networks: Old and New

A closer look at vertical integration of exports between country pairs underscores the profound role of China in regional trade.

- Based on direct and indirect trade flows for intermediate goods, and on data from Asian

⁵ This overall trend appears to be particularly clear for the subsegment of high-tech exports. First, the number of country pairs with a similarity index of 90 or higher has increased from four during 1998–2002 to six in 2005–09. Second, in the earlier period, the top-ranked pairs consisted of either industrial or emerging Asian economies. Third, in line with its rapid economic development, China's similarity indices of high-tech exports with both Japan and Korea have risen sharply, and, with the latter now close to 100, are significantly above any other pair. Consistent with economic convergence, Murshed (2001) finds a rise in intra-industry trade in manufactured goods for all Asian economies. Nevertheless, although consistent with broad economic trends, the similarity index may overstate the degree of competition as it does not capture differences in quality or technological sophistication within product categories.

Figure 3.1. Asia: Export Trends



**Figure 3.2. Selected Asia: Contributions to Export Growth
(In percent of total export growth; 1998–2009 average)**

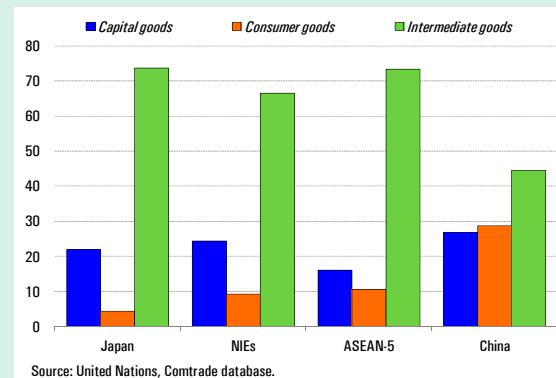
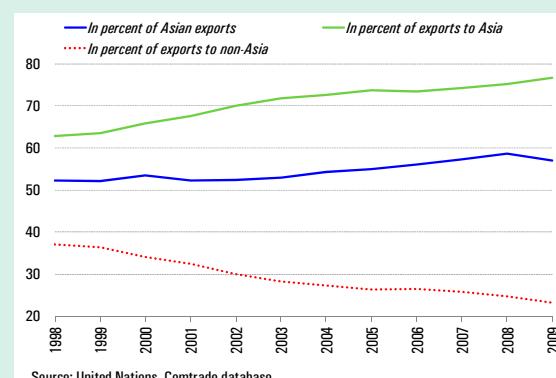
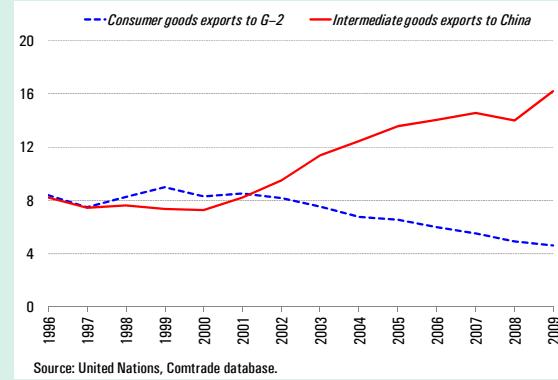


Figure 3.3. Asia: Exports of Intermediate Goods

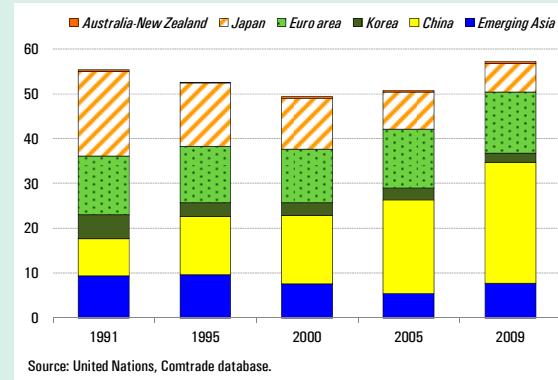


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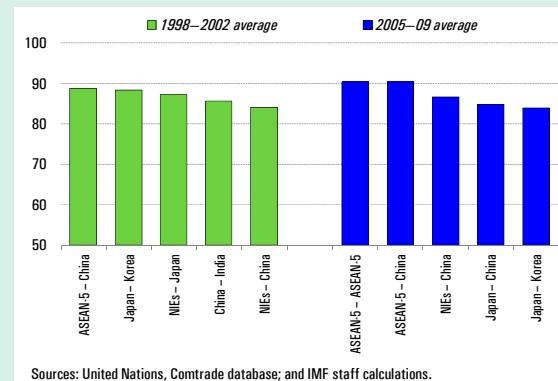
**Figure 3.4. Asia (excl. China): Exports to G-2 and China
(In percent of total exports)**



**Figure 3.5. Share in U.S. Imports: Consumer Goods
(In percent)**



**Figure 3.6. Selected Asia Export Similarity Index
(Top five country pairs for capital goods)**



input-output tables that allow one to trace the final sources of supply and demand, we estimate that China ultimately accounts for about 50 percent of all trade flows in imported inputs in Asia, more than double its share in 1995.⁶ As such, China has become, for many of its Asian trading partners, the single most important destination of intermediate goods exports. The predominant intermediate goods suppliers to China have consistently been Japan, Korea, and Taiwan Province of China, accounting for almost 80 percent of China's imported inputs (Figure 3.7; Appendix Table 3A.1).⁷

- But China's role as a supplier to other Asian economies has also rapidly grown. China's share in direct and indirect intermediate goods exports within Asia has doubled to nearly 30 percent in 2009, from 15 percent a decade earlier.
- Korea has the closest link to China. It directly exports nearly 40 percent of its intermediate goods exports to China, four times its exports to Japan, its second most important export destination of intermediate goods. Adding indirect exports—intermediate goods that Korea exports to other countries in the region, such as the ASEAN-4, and eventually find their way into Chinese production—Korea exports about 60 percent of its intermediate goods to China.
- China's share has also increased in the intermediate goods exports of the ASEAN-4 economies. At the beginning of the 2000s, Japan was, by a wide margin, the most important destination of intermediate goods exports, accounting for an average 20 percent of direct

⁶ For a detailed description of the methodology used to update the 2000 Asian input-output tables provided by the Japan External Trade Organization (JETRO) and to calculate direct and indirect trade exposures, see Appendix 3.1 and Mohammad, N'Diaye, and Unterhofer (2011). The JETRO data encompass nine regional economies, including China, Indonesia, Japan, Korea, Malaysia, the Philippines, Singapore, Taiwan Province of China, and Thailand.

⁷ Estimates of the value-added content of Chinese exports also point to China taking a greater share of the value chain (that is, bringing some of the intermediate inputs production onshore).

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exports from these countries. A decade later, Japan's share has fallen to an average 15 percent. By contrast, China's share more than tripled over the same period from about 4 percent to 14 percent.

- Considering that, in addition to intermediate goods, capital goods are also used as inputs, the supply-chain links from Japan and Korea to China are likely significantly stronger. China's ascent as a leading exporter has been fuelled by a high investment rate (April 2010 Asia and Pacific Regional Economic Outlook).⁸ For Japan and Korea, capital goods exports to China now account for 20 percent to 25 percent of their total capital goods exports (a fourfold increase from a decade earlier), making China by far their single most important capital goods export destination in Asia, and comparable to the United States or the European Union as export markets (Figure 3.8).⁹

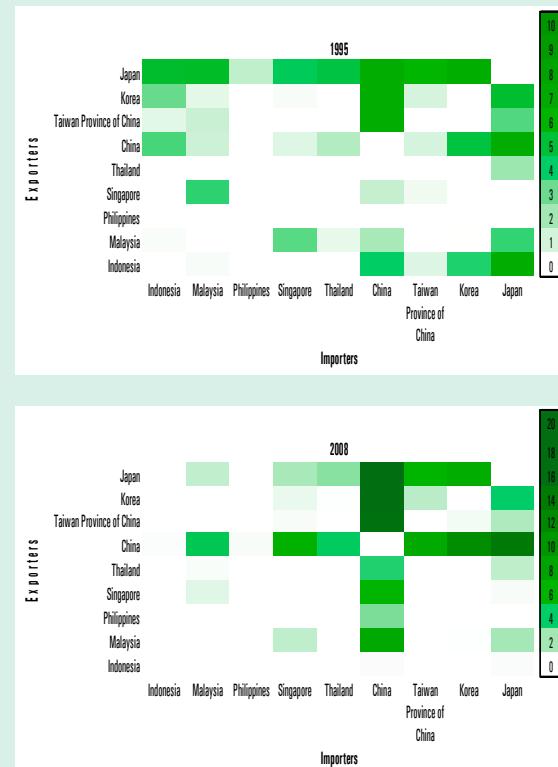
Asian trade networks outside China have become relatively less significant over time. This trend has been particularly evident for Japan, which was the central hub in the 1990s, accounting for about 40 percent of imported inputs in other regional economies, compared with about 25 percent in 2008 (Figures 3.7 and 3.9). However, unlike China, Japan has traditionally taken the role of net exporter of parts and components rather than net importer.

- As a result, direct and indirect input linkages between the two leading industrial economies in the region, Japan and Korea, have also become relatively less important. Although their mutual supply relationships accounted for about

⁸ Consistent with the role of capital goods as imported inputs, Eichengreen, Rhee, and Tong (2007) find that Asian exports to China are positively affected by the growth of Chinese exports and "that this effect is mainly felt in markets for capital goods." Similarly, Johansson (2006) finds that inward FDI positively affects Chinese electronics exports.

⁹ For a description of various types of global value chains and their impact on trade and investment patterns, see Milberg and Winkler (2010). Using firm-level surveys, Kawai and Wignaraja (2011) find that growing production networks have benefited from firms' growing use of regional free-trade agreements.

**Figure 3.7. Selected Asia: Direct and Indirect Intermediate Goods Trade
(In percent of total regional flows)**



Sources: Institute of Development Economics, Japan External Trade Organization, *Asian Input Output Tables*, 2000; United Nations, Comtrade database; and IMF staff calculations.

**Figure 3.8. Japan and Korea: Export of Capital Goods
(By destination; in percent of total exports)**

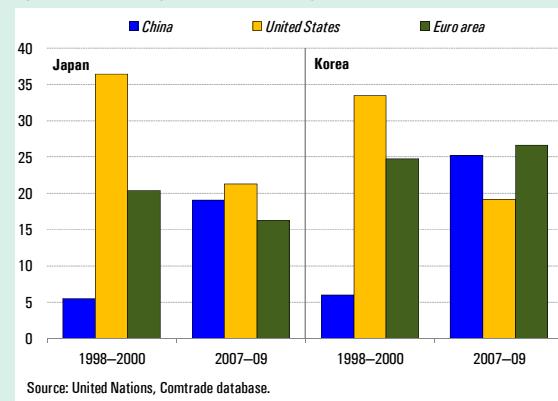
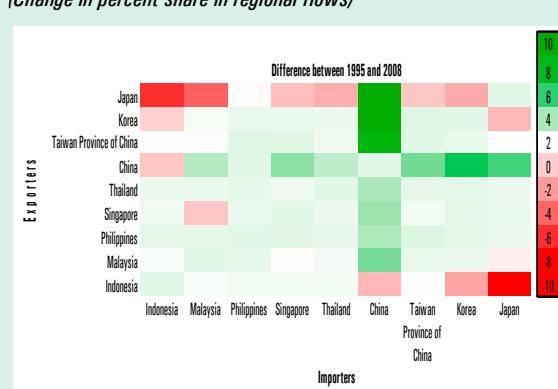


Figure 3.9. Selected Asia: Change in Intermediate Goods Trade
(Change in percent share in regional flows)



Sources: Institute of Development Economics, Japan External Trade Organization, *Asian Input Output Tables*, 2000; United Nations, Comtrade database; and IMF staff calculations.

10 percent of regional import flows in intermediate goods in 1995, a decade later the Japan–Korea import links represent less than 5 percent.

- Intermediate goods trade among the NIEs and the ASEAN-4 has generally been less significant than the links described above as a share of regional flows, with direct and indirect bilateral flows of intermediate goods typically accounting for less than 1 percent of regional flows. However, notable exceptions include the outsourcing links between Malaysia and Singapore, and Taiwan Province of China and Korea, which each accounts for about 1½–2 percent of intra-Asian intermediate trade flows.

Although Asian supply chains have become increasingly centered on China, sustained disruptions to production in Japan as a result of the March 2011 earthquake and tsunami could affect them. For all major Asian economies, Japan remains the second most important source of intermediate inputs after China, and it remains the single most important supplier to China, where it accounts for 36 percent of all imported inputs sourced from Asia. Moreover, its supply of electronic components and capital goods may not be easily substitutable as the

outsourcing hierarchies reflected in bilateral surplus and deficit positions in intermediate goods trade have remained relatively stable. Japan has consistently run intermediate goods surpluses with all its Asian trading partners, except for a small deficit with the ASEAN-4 economies (Figure 3.10).¹⁰

D. How Does Vertical Integration Affect External Competitiveness and Rebalancing?

The increased degree of vertical trade integration in Asia affects the impact that movements in exchange rates have on the competitiveness of Asian economies. In the presence of vertical integration, the cost of imported intermediate inputs can account for a significant share of the exporter's total cost. On average over 2005–08, the share of imported value added in exports ranged from about 10 percent in Japan to about 40 percent in the smaller open economies, such as Malaysia, having increased sharply since the previous decade.¹¹ The cost of the imported intermediate inputs (in terms of the final export market currency) is not affected by the exchange rate of the exporter, but by the exchange rate of its suppliers (relative to the export market currency). Hence, if only the exchange rate of the exporter appreciates, while those of its suppliers remain constant (in terms of the export market currency), the impact on the exporter's total costs in export market currency terms is lower than if the currencies of the suppliers also appreciate.¹²

¹⁰ The relatively stable outsourcing hierarchies at the country level are mirrored by relatively stable cross-border production networks at the firm level, which are often led by multinational companies in advanced Asia as documented by Kimura and Ando (2005); Borrus, Ernst, and Haggard (2000); and Thorbecke (2010).

¹¹ See also Hummels, Ishii, and Yi (2001); Koopman, Powers, Wang, and Wei (2010); and Powers, Wang, and Wei (2009).

¹² As an example, assume a 3-country world in which country A exports only final goods to country B. Assume further that the domestic value added in A's exports is 50 percent, while the other 50 percent are imported inputs from country C. Let A's exchange rate appreciate 10 percent vis-à-vis B and C (and hence the cross-rate between B and C remains constant). Although A's exchange rate appreciates 10 percent vis-à-vis B,

continued

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Conventional real effective exchange rates only partially reflect changes in export competitiveness. Real effective exchange rates compare the prices of domestic and foreign goods at the same stage of production, and therefore do not explicitly account for the impact of movements in the exchange rates of “upstream” supplier economies on the costs in “downstream” export markets. Based on Thorbecke (2010) and Thorbecke and Smith (2008), we augment real effective exchange rate calculations to take account of vertical linkages and estimate an “integrated effective exchange rate (IEER)” based on the breakdown of an export good’s total costs (expressed in the export market currency) into the value added produced directly by the exporter and the value added produced by its supplier economies.¹³ The main difference of the IEER from the conventional real effective exchange rate (REER) for a given country is that in addition to that country’s own exchange rate movements, it also factors in its supplier economies’ exchange rate movements vis-à-vis its final export markets.¹⁴ The main results are as follows (Figure 3.11):

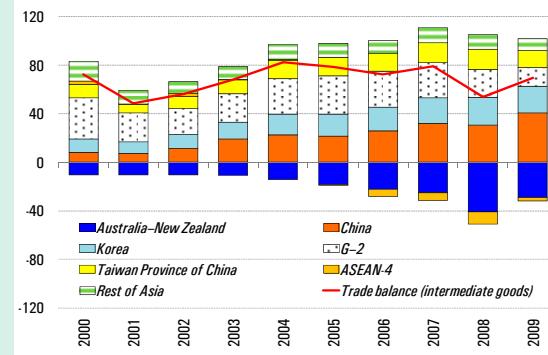
- In the case of China, the integrated effective exchange rate has appreciated more slowly in recent years than the conventional effective exchange rate. This reflects the fact that currencies of important China-supplier economies, in particular Korea, have depreciated vis-à-vis China’s major export markets.
- Likewise, although Korea’s real effective exchange rate has depreciated by

the effective cost of A’s exports in B’s currency only rises 5 percent. This is because supplier C’s exchange rate vis-à-vis B is unchanged, and supplier C accounts for 50 percent of the value of A’s exports to B.

¹³ Of course, the input shares could change in response to a change in relative costs induced by exchange rate movements, but such changes typically happen only gradually over time.

¹⁴ As with the conventional REER, trading partner weights are applied to a given country’s own exchange rate movements, which matter for the share of domestic value added in that country’s exports. As for the share of imported value added, an effective rate is applied, taking into account the share of each supplier in the imported value added and the share of each export market in exports (and applying these weights to the real exchange rate between the suppliers and export markets). See Appendix 3.1 for details.

**Figure 3.10. Japan: Trade Balance in Intermediate Goods
(In billions of U.S. dollars)**



Source: United Nations, Comtrade database.

about 25 percent since the global financial crisis, its integrated effective exchange rate has depreciated much less (by only about 15 percent), as the currencies of key suppliers to Korea’s economy (in particular Japan and China) have appreciated over the same period.

- By contrast, changes in Japan’s integrated effective exchange rate have been more closely tracked by movements in the real effective exchange rate, and in particular, its appreciation since 2007. This is explained by the relatively high local content of Japanese exports and because the currency of the most important supplier, China, also generally appreciated.

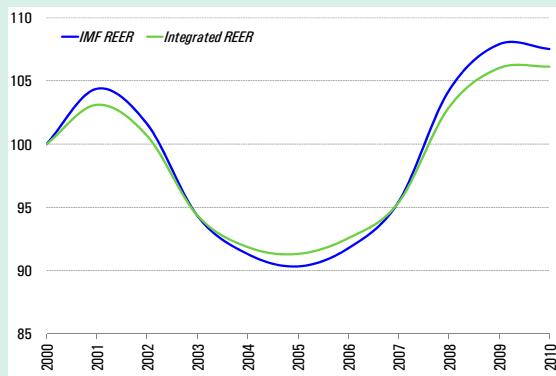
In general, movements in the integrated exchange rate appear to be more closely related to exports than changes in the conventional real effective exchange rate (Figure 3.12). The relatively strong and statistically significant correlation between changes in the integrated exchange rate and export growth suggests that accounting for vertical trade integration is important when gauging the effect of exchange rate movements on external competitiveness.¹⁵

¹⁵ This result also holds if the integrated exchange rate is calculated based on estimates of the domestic and imported value added in exports from other studies (Koopman and others, 2010, based on Global Trade Analysis Project (GTAP) data for 2004; and Powers, Wang, and Wei, 2009, based on Asian input-output tables for 2005).

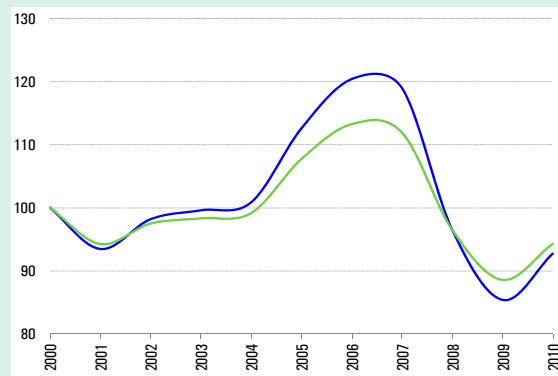
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**Figure 3.11. Selected Asia: Standard and Integrated Real Effective Exchange Rates (REER)
(2000 = 100)**

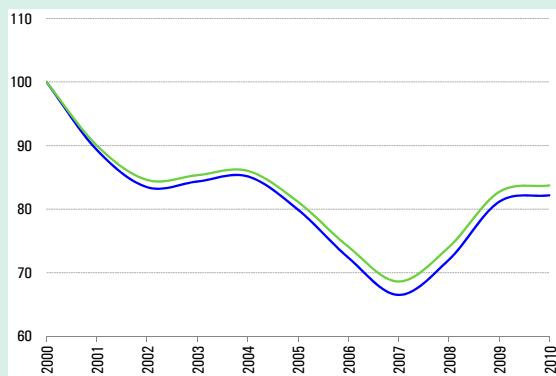
China



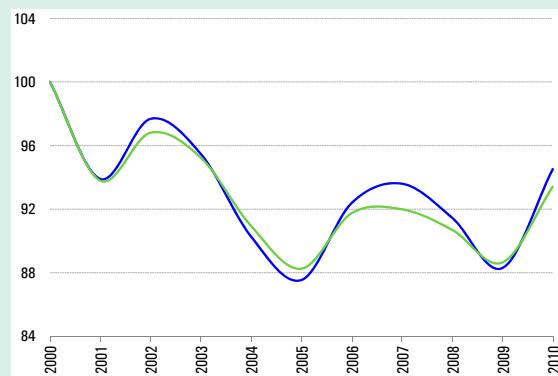
Korea



Japan



ASEAN-4



Sources: Institute of Development Economics, Japan External Trade Organization, *Asian Input Output Tables*, 2000; United Nations, Comtrade database; IMF, Information Notice System database and staff calculations.

Ignoring the role of imported inputs in total export costs, the conventional real effective exchange rate tends to move more than the integrated one, and generally overstates the potential impact of a country's exchange rate movements on its exports.¹⁶ By contrast, adjusting

¹⁶ Consistent with the generally stronger correlation of the integrated effective exchange rate with export growth, Thorbecke and Smith (2008), using a standard export model (Goldstein and Khan, 1985) in a panel data set for Chinese exports to 33 countries, find that an appreciation of the renminbi has a much larger negative impact on exports with a high domestic value-added content than on those with a low domestic value-added content. In addition, using the integrated exchange rate approach, Ahmed (2009) finds that in the case of China, a renminbi appreciation vis-à-vis supplier economies in the region has no significant impact on processing goods exports (that is, exports with a relatively low domestic value-added content).

the real effective exchange rate to reflect the degree to which Asian economies compete in third markets yields another alternative measure of effective exchange rates, one that tends to move relatively closely with the conventional one (Box 3.1). This also appears to support the view that vertical integration is a relatively more important determinant of Asian economies' export competitiveness than horizontal competition (in goods at the same stage of production) in third markets.

Ignoring vertical integration as the primary driver of intra-Asian trade may also overstate the importance of regional domestic demand as a driver of growth. As highlighted in the April 2010 Asia and Pacific *Regional Economic Outlook*,

IMPLICATIONS OF ASIA'S REGIONAL SUPPLY CHAIN FOR REBALANCING GROWTH

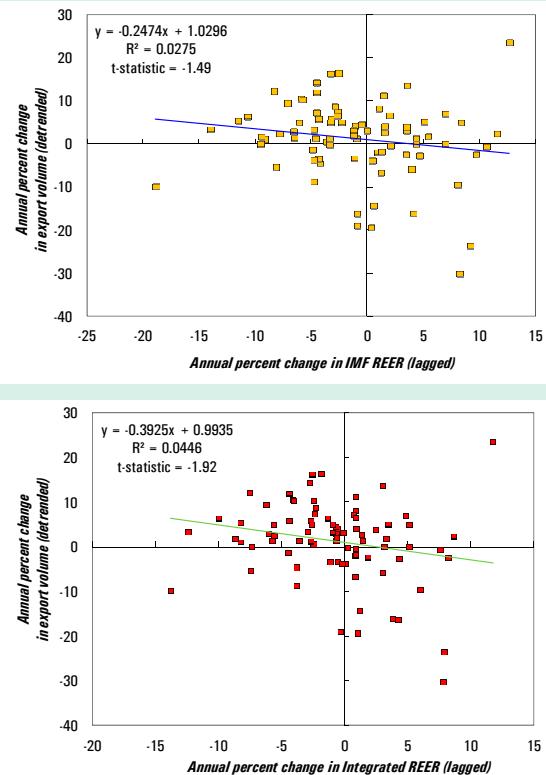
vertical integration masks the importance of final sources of demand outside Asia, especially for the smaller, more open regional economies. The upshot, however, is that the loss of market shares of Asian economies to China in final goods exports to advanced economies understates their total exposure. Through vertical trade, all Asian economies have increased their indirect trade exposure to the United States and other advanced economies.

Moreover, bilateral trade surpluses based on gross exports are an imperfect indicator of global demand imbalances. The bulk of the U.S. trade deficit in consumer goods, for example, appears to roughly match China's trade surplus in consumer goods (Figure 3.13). But we have shown that Chinese exports embed a significant amount of inputs imported from other economies in the region. A measure of bilateral trade imbalances that accounts for vertical integration should repartition the imported inputs embedded in China's exports across Asian economies, and add them to their direct exports. On such value-added-based terms, China's trade surplus with the United States shrinks, whereas that of most other Asian economies increases. Similar to the impact of exchange rate movements, this suggests that as the degree of vertical trade integration increases, imbalances should be assessed at the level of supply chain networks on a value-added basis instead of individual countries' trade balances based on gross exports and imports (Figure 3.14).

E. Conclusion

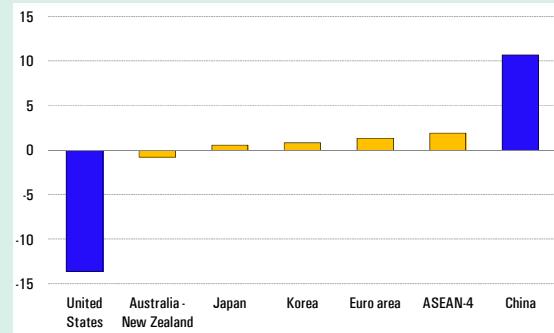
Asia's high degree of vertical integration implies that a durable reduction in its imbalances will require adjustment across all major Asian economies and currencies. The economies of the region have become part of a greater supply network, with China taking the role of an assembly hub for final goods exports, notably consumer goods. Hence, gross trade exposures mask the impact of shifts in global demand on Asian economies' exports and growth. Moreover,

Figure 3.12. Asia: Real Effective Exchange Rates (REER) and Real Export Growth



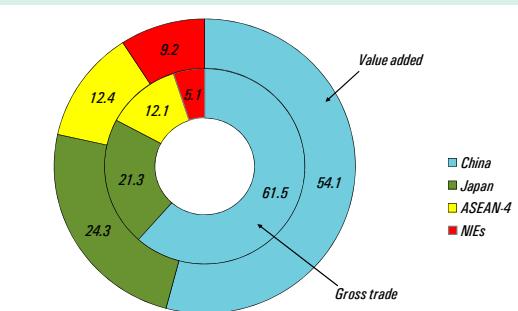
Sources: IMF, Information Notice System database, and staff calculations.

**Figure 3.13. Net Exports to World Markets: Consumer Goods
(Percent share in world exports minus percent share in world imports, excluding intragroup trade; 2005–08 average)**



Source: United Nations, Comtrade database.

Figure 3.14. Selected Asia: Share in Trade Surplus vis-à-vis U.S.—Value Added and Gross Trade
(In percent of total; 2005–08 average)



Sources: Institute of Developing Economies, Japan External Trade Organization, *Asian Input Output Table*, 2000; United Nations, Comtrade database; Haver Analytics; and IMF staff estimates.

the new trade structures defy conventional views of the impact of exchange rates on external competitiveness. A real effective exchange rate appreciation, unless it is matched by appreciations of supplier currencies, may have a smaller impact on exports and global rebalancing than conventional trade models and effective exchange rates suggest.

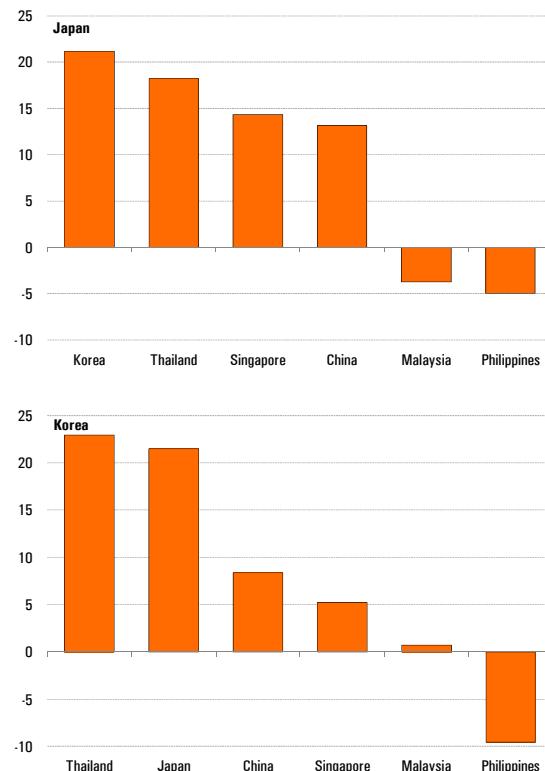
Box 3.1. Horizontal Competition and the Real Effective Exchange Rate

To account for the fact that product differentiation tends to lower the degree of potential competition, we also calculate a similarity-adjusted real effective exchange rate (Appendix 3.1 for details). The implication is that countries whose exports are more similar should be given greater weights when effective exchange rate measures are used to assess the impact of bilateral exchange rate movements on competitiveness. However, comparing the weights of our similarity-adjusted real effective exchange rate with those of the conventional real effective exchange rate suggests that major deviations, in particular concerning big trading partners, are typically limited. As a result, similarity-adjusted real effective exchange rates tend to move relatively closely with conventional ones. Nevertheless, there are a few noteworthy country-pair exceptions where actual competition may differ from what is implied by weights in the conventional effective exchange rates.

- For consumer goods exports, the weight of the euro area countries in Japan's effective exchange rate is about 5 percentage points higher than simple trade weights in the conventional real effective exchange rate measure suggest. A similar adjustment applies to the weight of the United States in Korea's consumer goods exports.
- For capital goods, the weights of Japan and China in Korea's similarity-adjusted effective exchange rate are about 2 percent and 5 percentage points higher, respectively.
- Regarding intermediate goods, the weight of Japan in Korea's basket and vice versa is about 3 percentage points higher, an increase of more than 20 percent over the conventional trade weights (figure). Competition, or similarity-adjusted, trade weights between China, on the one hand, and Japan and Korea, on the other, are also higher, although the required adjustments are generally smaller.

Japan and Korea: Change in Similarity-Adjusted Exchange Rate Weights

(By major intermediate goods trading partner; in percent of standard weight)



Source: IMF staff calculations.

Note: The main authors of this box are Adil Mohammad, Olaf Unterhofer, and Jade Vichyanond.

Appendix 3.1.

Export similarity index

The export similarity index between two economies j_1 and j_2 is defined as

$$100 \sum_i s(i, j_1) s(i, j_2) / (\sqrt{\sum_i s(i, j_1)^2} \sqrt{\sum_i s(i, j_2)^2}) \quad (1)$$

where $s(i, j)$ represents the share of good i in country j 's exports.

Because the index is more precise the higher the degree of disaggregation (or the greater the number of goods), it is based on SITC-5 level trade statistics. At this level, consumer goods comprise 287 line items, 171 capital goods, and 884 intermediate goods. Note that the similarity index is invariant to economic size because it is based on shares in total exports.

Integrated effective exchange rate

The measure of the integrated effective exchange rate for a country is defined as (Thorbecke, 2010; and Thorbecke and Smith, 2008):

$$ireer = DVA \text{ reer} + (1-DVA) \sum_j (w_j \sum_k input_k \text{ rer}_{kj}) \quad (2)$$

where j denotes the country's export destinations, k its suppliers, DVA the share of domestic value added in gross exports, reer the real effective exchange rate, rer the real bilateral exchange, $input_k$ the share of supplier k in the country's intermediate goods imports (in value-added terms), and w_j the weight of destination j in the country's exports.

Our estimates of the share of domestic value added in exports and the shares of supplying economies in imported value added are taken from Mohammad, N'Diaye, and Unterroberdoerster (2011). They are based on analysis of Asian input-output (AIO) tables encompassing nine regional economies (China, Indonesia, Japan, Korea, Malaysia, the Philippines, Singapore, Taiwan Province of China, and Thailand) and the United States. We obtain AIO 2000 tables from the

Japanese External Trade Organization and follow updating procedures in Pula and Peltonen (2009) using National Accounts and the United Nations, Comtrade database.

To the extent that they cover similar countries, our estimates, in particular the variation across Asian economies and over time, are generally comparable with other studies using different data sets and covering earlier time periods (such as Hummels, Ishii, and Yi, 2001 for OECD countries; Koopman and others, 2010 using GTAP data; and Powers, Wang, and Wei, 2009 using Asian input-output tables for 1990 and 2000).

Similarity-adjusted effective exchange rate

We define our measure of the similarity-adjusted real effective exchange rate as:

$$reersim_i = \sum_j sim_{j,i} w_{j,i} \text{ rer}_{j,i} \quad (3)$$

$sim_{j,i}$ represents the export similarity index between country j and i , $w_{j,i}$ is the weight of country j in country i 's real effective exchange rate basket, and $\text{rer}_{j,i}$ is the bilateral real exchange rate.

As such, $reersim_i$ is country i 's real effective exchange rate where the weights of trading partners are adjusted for the degree of export similarity. The adjusted weights are normalized to one.

$reersim_i$ is calculated for capital, consumer, and intermediate goods, with a country's overall effective rate being a weighted average of the three and the weights derived from their respective share in total exports.

Methodology for construction input flows matrix in Figure 3.7.

Based on Asian cross-border input-output tables, we derive the Leontief inverse matrix. Each element of a given column in this matrix specifies the input requirement from each row country i for a unit of output in the column country j , both flowing directly from i to j and indirectly from i to any third country

IMPLICATIONS OF ASIA'S REGIONAL SUPPLY CHAIN FOR REBALANCING GROWTH

k , and from k to j (the indirect relationships are not restricted to 3-step chains, but take into account chains of any length within the input-output relationship). Multiplying gross output of each column country j with the i,j -th coefficient in the inverse matrix gives total direct and indirect input

flows from i to j . Summing these input flows into all j 's equals total input flows within the region. In Figure 3.7., each cell in the grid indicates the share of a given bilateral flow from i into j in the total (direct and indirect) input flows within the region.

Table 3A.1. Share in Intermediate Goods Exports¹
(In percent of total exports)

1998–2000	Australia	China	Hong Kong SAR	Indonesia	India	Japan	Korea	Malaysia	New Zealand	Philippines	Singapore	Thailand	Taiwan Province of China	Vietnam	United States	Euro area
Australia	...	7.6	4.1	3.1	3.1	25.5	11.6	2.3	5.7	1.8	6.6	2.5	7.4	0.5	8.7	9.7
China	1.3	...	26.5	1.7	1.5	17.6	8.3	1.7	0.2	1.3	3.5	1.9	4.3	0.9	16.6	12.9
Hong Kong SAR	0.9	62.6	...	0.7	1.2	3.8	2.3	1.3	0.1	1.4	3.5	1.4	3.7	0.3	11.1	5.8
Indonesia	3.8	6.5	3.6	...	2.4	29.4	9.9	3.7	0.2	2.0	10.6	2.0	5.4	1.0	9.0	10.4
India	1.5	3.3	15.9	1.9	...	7.2	2.6	1.9	0.2	0.6	3.2	2.8	2.1	0.8	31.5	24.6
Japan	1.3	9.6	8.0	2.2	0.9	...	8.6	4.5	0.2	3.4	5.5	4.5	9.7	0.5	29.1	12.0
Korea	2.0	17.5	11.2	2.9	1.5	11.4	...	4.7	0.2	3.9	5.3	2.1	6.8	1.7	20.5	8.3
Malaysia	2.0	4.1	5.4	1.8	3.2	13.1	4.2	...	0.3	2.1	20.8	4.7	5.9	0.6	20.6	10.9
New Zealand	30.3	5.5	2.6	1.7	1.5	19.5	8.4	1.7	...	1.4	1.5	1.1	2.8	0.5	14.0	7.5
Philippines	0.4	2.2	6.6	0.5	0.2	14.0	3.8	5.4	0.0	...	10.7	4.5	8.7	0.2	26.9	15.7
Singapore	2.2	4.2	6.9	14.6	2.0	5.6	3.3	20.6	0.3	2.7	...	5.3	6.1	0.9	14.8	10.8
Thailand	1.6	6.5	8.2	2.5	1.1	16.3	3.0	6.8	0.2	2.7	13.0	...	6.6	1.8	16.9	12.9
Taiwan Province of China	1.2	4.5	31.0	1.7	0.7	10.8	3.6	3.5	0.2	3.2	5.2	2.4	...	1.6	19.8	10.8
Vietnam	18.7	17.0	1.5	3.0	0.4	16.6	1.8	5.1	0.1	6.2	11.1	4.9	3.8	...	3.1	6.6
2007–2009	Australia	China	Hong Kong SAR	Indonesia	India	Japan	Korea	Malaysia	New Zealand	Philippines	Singapore	Thailand	Taiwan Province of China	Vietnam	United States	Euro area
Australia	...	24.1	1.1	2.3	10.2	24.7	11.1	2.1	3.0	0.7	2.6	3.6	4.7	1.1	2.8	6.0
China	1.8	...	21.1	2.1	4.4	10.8	10.1	2.6	0.2	1.3	3.2	2.1	4.0	2.3	17.0	17.1
Hong Kong SAR	0.6	72.8	...	0.7	2.6	3.0	2.4	1.1	0.0	0.9	1.9	1.6	2.4	1.0	4.9	4.0
Indonesia	3.6	12.5	1.6	...	7.6	24.8	9.4	6.0	0.4	2.0	9.5	3.3	3.4	1.5	5.5	9.0
India	1.2	18.6	11.5	3.0	...	3.9	3.5	3.0	0.2	0.8	3.6	2.8	1.5	2.4	19.3	24.6
Japan	1.1	24.8	6.8	2.3	1.3	...	12.2	3.4	0.1	2.1	3.4	6.2	9.1	1.4	15.8	10.0
Korea	1.2	38.1	8.8	2.3	3.3	9.4	...	2.3	0.2	1.9	3.9	2.4	6.0	2.4	10.4	7.5
Malaysia	4.0	13.6	5.6	3.8	5.0	13.5	5.7	...	0.5	1.9	15.5	6.5	3.7	1.8	9.1	9.8
New Zealand	34.2	11.8	1.6	3.3	1.8	12.6	5.5	2.3	...	2.1	3.2	2.3	1.7	1.4	10.0	6.1
Philippines	0.7	12.3	13.9	1.1	0.6	15.8	4.7	4.2	0.0	...	7.4	3.5	5.0	1.1	8.6	21.1
Singapore	2.7	12.9	12.8	9.7	3.8	5.5	6.1	14.4	0.3	2.3	...	5.0	4.6	1.7	9.0	9.2
Thailand	5.1	14.9	9.5	5.1	3.4	14.9	3.4	8.1	0.4	2.5	7.3	...	2.7	4.5	9.6	8.5
Taiwan Province of China	1.1	33.2	18.8	1.4	1.2	8.0	4.6	2.7	0.1	2.3	4.5	2.3	...	2.9	10.1	6.8
Vietnam	15.7	14.3	1.2	2.8	1.0	20.7	3.7	6.0	0.1	2.1	8.9	4.4	3.0	...	8.6	7.3

Sources: United Nations, Comtrade database; and IMF staff calculations.

¹ Column headings represent export destinations.

REGIONAL ECONOMIC OUTLOOK: ASIA AND PACIFIC

Table 3A.2. Share in Capital Goods Exports¹

(In percent of total exports)

1998–2000	Australia	China	Hong Kong SAR	Indonesia	India	Japan	Korea	Malaysia	New Zealand	Philippines	Singapore	Thailand	Taiwan Province of China	Vietnam	United States	Euro area
Australia	...	3.7	5.0	3.5	1.6	5.2	2.0	2.5	18.3	1.3	10.2	1.2	2.7	0.7	24.1	17.8
China	1.2	...	20.5	1.1	0.4	12.0	3.6	1.4	0.1	0.8	3.9	0.9	2.6	0.4	30.1	21.0
Hong Kong SAR	1.1	35.4	...	0.3	0.4	6.6	1.9	1.4	0.2	1.4	3.4	1.2	3.7	0.3	27.5	15.1
Indonesia	1.7	0.8	2.7	...	0.5	9.8	0.4	4.6	0.2	1.2	33.8	6.5	1.4	0.4	22.8	13.0
India	1.8	2.7	3.4	1.8	...	5.6	0.9	3.4	0.2	1.1	7.8	2.6	0.8	2.8	26.3	38.9
Japan	2.8	5.5	5.4	1.1	0.8	...	5.4	2.4	0.4	1.7	5.2	2.4	9.7	0.4	36.4	20.4
Korea	2.7	6.0	5.2	1.2	1.7	9.4	...	2.2	0.2	1.3	4.0	1.2	5.9	0.8	33.4	24.8
Malaysia	5.0	1.9	4.6	1.5	1.6	12.0	1.2	...	0.5	1.4	15.3	1.7	2.8	0.3	32.3	17.9
New Zealand	48.1	1.1	4.1	0.3	0.7	2.6	1.2	1.1	...	0.4	3.0	0.3	1.2	0.2	22.4	13.3
Philippines	2.7	0.5	3.3	0.4	0.0	23.6	3.0	0.5	0.1	...	4.8	0.6	11.6	0.1	30.9	18.0
Singapore	2.8	2.2	5.9	9.8	1.8	7.4	2.9	9.8	0.4	1.6	...	2.6	4.5	0.7	32.2	15.5
Thailand	7.1	2.0	3.9	0.6	0.6	14.8	1.2	2.9	0.8	1.6	10.6	...	2.0	0.5	28.8	22.8
Taiwan Province of China	1.8	1.5	14.0	0.8	0.5	16.3	2.3	2.0	0.1	0.9	2.9	1.5	...	0.7	36.6	18.0
Vietnam	3.5	0.7	7.9	2.0	0.1	37.6	7.8	1.2	0.1	0.8	6.8	1.2	11.1	...	1.8	17.5
2007–2009	Australia	China	Hong Kong SAR	Indonesia	India	Japan	Korea	Malaysia	New Zealand	Philippines	Singapore	Thailand	Taiwan Province of China	Vietnam	United States	Euro area
Australia	...	7.1	3.9	2.4	2.2	3.3	1.9	2.0	22.9	0.7	7.1	1.9	0.8	0.9	29.0	14.0
China	1.9	...	22.4	1.3	3.2	7.0	4.2	1.8	0.2	0.5	4.1	1.3	1.8	1.2	26.2	23.2
Hong Kong SAR	2.3	44.0	...	0.8	2.0	6.8	2.0	1.4	0.3	0.8	3.3	1.2	2.1	0.6	17.3	15.1
Indonesia	3.4	7.0	4.2	...	1.4	12.5	2.6	4.5	0.5	1.5	27.2	3.9	1.0	1.2	13.9	15.1
India	3.3	3.9	1.8	4.7	...	2.0	1.2	8.0	0.1	0.7	23.1	2.9	0.4	1.7	23.7	22.4
Japan	2.8	19.1	6.5	2.0	1.8	...	8.5	2.5	0.4	1.4	4.6	3.8	7.8	1.4	21.3	16.3
Korea	1.2	25.3	4.3	1.3	2.6	6.2	...	2.0	0.2	0.8	6.2	1.3	1.6	1.5	19.2	26.6
Malaysia	3.7	8.1	4.9	2.2	2.5	6.9	1.7	...	0.4	0.8	9.4	4.3	1.6	0.9	36.9	15.7
New Zealand	44.6	2.3	1.3	0.8	1.4	2.4	1.5	1.0	...	0.2	5.4	1.4	0.5	0.2	26.8	10.2
Philippines	0.4	10.9	5.5	0.8	0.2	20.2	6.2	5.6	0.0	...	2.5	1.8	1.7	0.2	32.9	11.1
Singapore	3.4	8.6	7.4	16.6	5.8	6.3	3.0	14.5	0.4	2.1	...	4.4	2.6	2.5	15.4	6.9
Thailand	7.2	18.1	8.2	2.7	1.8	10.5	1.8	4.6	0.6	1.0	4.9	...	2.1	1.6	17.6	17.3
Taiwan Province of China	1.4	32.8	9.7	1.1	1.4	5.3	1.7	2.0	0.1	0.5	2.2	2.0	...	1.6	21.9	16.3
Vietnam	3.1	9.7	5.9	0.6	0.6	15.5	3.6	3.4	0.3	1.1	7.4	2.4	1.5	...	22.1	23.1

Sources: United Nations, Comtrade database; and IMF staff calculations.

¹ Column headings represent export destinations.

Table 3A.3. Share in Consumer Goods Exports¹

(In percent of total exports)

1998–2000	Australia	China	Hong Kong SAR	Indonesia	India	Japan	Korea	Malaysia	New Zealand	Philippines	Singapore	Thailand	Taiwan Province of China	Vietnam	United States	Euro area
China	2.1	...	21.4	0.7	0.2	24.7	2.3	0.6	0.3	0.5	1.3	0.2	1.0	0.4	30.6	13.8
Hong Kong SAR	2.6	12.1	...	0.3	0.1	9.4	0.9	0.5	0.3	0.8	1.6	0.5	1.8	0.4	48.1	20.5
Indonesia	2.0	1.2	3.3	...	0.6	15.1	0.6	2.2	0.2	0.7	13.5	1.5	1.1	0.2	36.9	20.7
India	2.1	1.3	3.1	0.3	...	8.7	0.8	1.8	0.4	0.7	2.1	0.6	0.6	0.4	42.5	34.6
Japan	2.3	2.7	9.0	0.5	0.2	...	3.8	1.0	0.3	1.6	3.9	1.7	8.2	0.3	40.4	24.1
Korea	1.7	5.8	4.0	1.1	0.4	30.2	...	0.5	0.3	0.6	1.2	0.6	2.0	1.3	36.8	13.2
Malaysia	3.2	0.6	5.0	1.2	0.5	15.9	1.0	...	0.6	1.0	16.4	1.5	1.6	0.5	36.4	14.7
New Zealand	21.7	2.1	4.4	1.2	0.2	15.6	1.6	3.6	...	2.1	2.9	2.0	3.8	0.8	22.4	15.7
Philippines	1.0	1.1	3.2	0.7	0.1	15.7	1.3	0.7	0.1	...	1.6	0.6	1.5	0.2	62.8	9.4
Singapore	4.0	4.4	7.6	11.6	2.0	16.5	3.0	12.2	0.5	2.8	...	3.1	2.5	2.2	16.9	10.7
Thailand	2.6	1.7	3.5	2.3	0.4	21.1	0.9	2.1	0.3	0.8	4.5	...	1.7	0.7	41.6	15.8
Taiwan Province of China	1.9	0.7	10.6	0.7	0.2	17.6	1.3	1.1	0.2	1.0	1.6	1.4	...	0.7	45.2	15.9
Vietnam	1.9	8.1	3.4	1.1	0.4	24.9	3.8	1.8	0.2	1.8	3.1	1.0	8.7	...	9.5	30.2
2007–2009	Australia	China	Hong Kong SAR	Indonesia	India	Japan	Korea	Malaysia	New Zealand	Philippines	Singapore	Thailand	Taiwan Province of China	Vietnam	United States	Euro area
China	3.0	...	11.7	0.7	0.6	16.0	3.4	1.6	0.4	0.7	1.7	0.7	1.0	0.6	35.9	22.0
Hong Kong SAR	3.5	16.8	...	0.4	0.5	8.5	2.0	0.5	0.3	0.6	1.9	0.5	2.5	1.2	36.8	24.0
Indonesia	2.5	1.9	1.9	...	1.1	9.7	1.7	3.9	0.3	1.7	6.4	1.8	1.1	1.3	42.4	22.3
India	2.3	1.6	3.3	0.3	...	2.7	0.3	2.2	0.3	0.9	2.5	0.7	0.2	1.6	41.4	39.5
Japan	3.0	10.5	11.0	0.9	0.5	...	7.0	1.1	0.4	1.3	3.0	3.2	6.5	1.0	29.3	21.4
Korea	3.8	14.3	5.4	1.4	1.3	21.7	...	0.6	0.8	1.3	1.5	1.6	3.6	2.9	26.7	13.0
Malaysia	7.7	2.6	3.5	3.7	1.7	10.9	1.7	...	1.1	1.9	18.0	6.2	1.5	1.9	24.6	13.0
New Zealand	23.4	7.2	3.2	3.2	0.3	10.5	3.7	3.1	...	2.7	2.3	1.9	3.8	0.9	17.2	16.5
Philippines	1.4	1.4	2.5	1.9	0.4	14.7	2.9	3.5	0.4	...	2.2	3.2	1.2	1.4	46.2	16.6
Singapore	4.0	11.5	7.0	8.6	3.0	10.9	3.0	10.9	0.5	2.5	...	8.3	2.4	3.1	14.3	9.9
Thailand	4.3	3.1	3.9	2.7	1.5	18.6	1.3	4.8	0.6	2.8	3.7	...	1.6	2.5	30.7	18.0
Taiwan Province of China	2.9	6.5	11.8	0.9	0.6	13.4	3.9	1.5	0.4	1.3	1.7	3.5	...	1.8	34.9	15.1
Vietnam	2.3	2.7	1.5	1.1	0.3	11.1	2.9	1.8	0.2	4.8	1.2	0.7	2.7	...	41.2	25.4

Sources: United Nations, Comtrade database; and IMF staff calculations.

¹ Column headings represent export destinations.

IV. ASIAN LOW-INCOME AND PACIFIC ISLAND COUNTRIES: POLICY CHALLENGES AFTER THE GLOBAL CRISIS

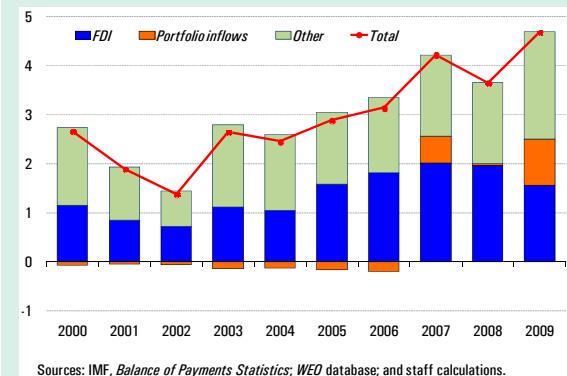
Most Asian low-income countries (LICs) and Pacific Island economies (PICs) continued to experience healthy economic growth in the second half of 2010. Strong exports of commodities and garments, a pickup in investment, especially in commodity sectors, and a rebound in tourism have benefited the region, while greater political stability and macroeconomic policy credibility continue to pay off. Nevertheless, slower remittances have added to balance of payments pressures in some cases, while inflationary pressures from food and commodity prices have increased economic and social vulnerabilities. Looking ahead, many Asian LICs and PICs will share with the emerging market economies of the region the challenges of managing the social impact of higher commodity prices and of maintaining sound financial systems in the face of rising and volatile capital inflows. Indeed, section A shows that even though remittances and aid remain the main sources of foreign funding for Asian LICs, gross capital flows have accelerated after the global crisis in a number of these economies. Healthy banking systems will be key to absorbing these flows in an orderly manner. Section B shows that while banks in Asian LICs have emerged relatively unscathed from the global crisis, they are also exposed to risks and vulnerabilities, including from sudden drying up of cross-border liquidity. Turning to the opportunities and challenges from higher commodity prices, section C looks at the experience of Timor-Leste in restoring political

stability and reducing poverty on the back of windfall gains from oil and gas, and section D highlights the vulnerability of PICs to commodity price shocks and offers policy options to address them.

A. Capital Flows, Aid, and Remittances to Asian LICs

Capital flows into Asian LICs weathered the global financial crisis relatively unscathed.¹ Starting from a low base, gross capital flows into Asian LICs tripled from US\$3.5 billion (2.9 percent of GDP) in 2005 to US\$10 billion (4.7 percent of GDP) in 2009 (Figure 4.1). The upward trend in capital inflows was merely halted in 2008 during the global crisis, before picking up again in 2009.

**Figure 4.1. Asian LICs: Gross Total Inflows
(In percent of GDP)**



Moreover, the structure of capital flows to Asian LICs has changed since the start of the crisis. For

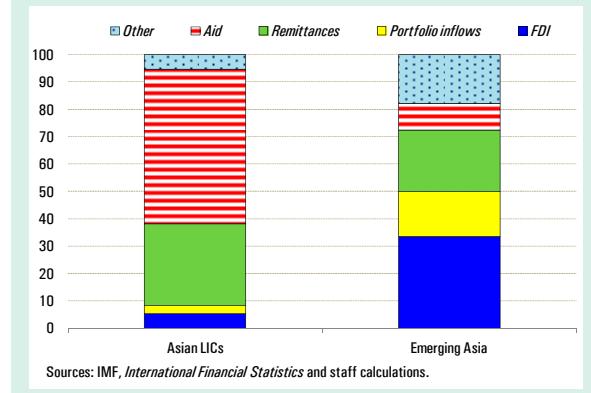
Note: The main authors of this chapter are Jonathan Dunn, Byung Kang Jang, Joedianna Mohammed, Svitlana Maslova, Erdembileg Ochirkhuu, Jookyoung Ree, Niamh Sheridan, and Jie Yang.

¹ Capital flow data of Asian LICs (Bangladesh, Cambodia, Lao P.D.R., Mongolia, Myanmar, Nepal, Papua New Guinea, and Sri Lanka) have to be interpreted with some caution, given gaps in quality, coverage, and timeliness.

the first time in this century, a few Asian LICs have experienced portfolio inflows starting from early 2000, in particular Sri Lanka, but also Bangladesh and Mongolia. At the same time, the share of foreign direct investment (FDI) in total inflows declined in 2009.

Compared with emerging Asian economies, capital flows to LICs are generally smaller, and these economies are still heavily dependent on aid flows and remittances. Gross capital inflows in LICs have averaged less than 3 percent of GDP over the past five years, compared with an average of 3.7 percent of GDP in Asian emerging economies. Remittances and aid have accounted for 86 percent of total foreign flows to Asian LICs in 2009, compared with 32 percent in emerging Asian economies (Figure 4.2).

Figure 4.2. Selected Asia: Structure of Capital and Capital-like Inflows, 2009
(In percent of total)



Aid and remittances provided a stable flow of funds to Asian LICs during the global financial crisis. Aid inflows to Asian LICs rose from 13 percent of GDP in 2007 to more than 15 percent in 2009, creating some space for countercyclical macroeconomic policies. Traditional development partners have kept their share of GDP devoted to aid relatively constant, despite the need for fiscal consolidation in some of those countries. At the same time, new development partners, such as China, increased aid to the region, particularly to commodity exporters. International financial institutions have also increased their aid to Asian LICs, in order to

help them maintain macroeconomic stability during the recent crisis. Remittances have been resilient, although experience has varied across countries depending on migration patterns.

The outlook for private capital flows is improving, although it is more mixed for remittances.

- Portfolio inflows to Asian LICs are likely to continue, given the ample global liquidity and the increased attractiveness of these economies' assets, thanks to their progress in improving governance, reducing discrimination between foreign and domestic investors, and developing financial markets. For example, a stock exchange was recently opened in Lao P.D.R., with a successful initial public offering of an electricity company; and Bangladesh received its first credit rating in 2010. In addition, currently high commodity prices are likely to provide additional impetus for investment into the commodity-exporter LICs.
- Meanwhile, the strong growth of remittances observed in the past few years may soften. The numbers of migrant workers from Asian LICs has stabilized in 2010 (and declined sharply in Bangladesh; Figure 4.3), and it is unlikely to pick up in the near future as unemployment in advanced economies and the oil-producing Middle East countries (a key destination of Asian migrants so far) remains high and the migration flows to Asian emerging economies remain still relatively low, although increasing at a fast rate.

B. Impact of the Global Crisis on Asian LIC Banks

Asian LICs such as Cambodia, Lao P.D.R., and Sri Lanka that are experiencing a pickup in capital flows may need a commensurate buildup in banking system capacity to absorb these flows in an orderly manner. Moreover, as LICs recover from the impact of the global financial crisis, their

growth prospects will depend, among other things, on the state of their banking systems. Vulnerable banking sectors would make economic growth more susceptible to new shocks, particularly as countries are emerging from the crisis with substantially reduced policy space. Banking fragility may also delay adjustments in countries where monetary tightening is needed to deal with rising inflationary pressure (such as Bangladesh, Lao P.D.R., and Nepal). This section assesses how banks in Asian LICs were affected by the global financial crisis and lessons to be taken from this experience.²

Bank-level data across a number of Asian LICs and emerging economies suggest the following:³

- **Funding:** Growth of customer deposits declined sharply in LIC banks in 2008, but bounced back subsequently, closely mirroring the pattern in emerging Asian banks (Figure 4.4). The decline in deposit growth involved both larger and smaller banks. Growth in wholesale funding for banks in LICs followed a similar pattern, with a sharp decline in 2008 followed by a rapid rebound in 2009. This contrasts with large emerging Asian banks, for which wholesale funding growth remained relatively flat in 2009. The rapid recovery of wholesale funding for the LIC banks likely reflects their greater reliance on intraregional, interoffice flows rather than on international money markets.
- **Lending:** In 2008, growth of bank lending moderated in Asian LICs more than in emerging Asia (Figure 4.5) although there was little impact on nonperforming loan (NPL) ratios. In the four years leading to the crisis,

² Bank-level data from Bankscope were examined for five Asian LIC countries: Bangladesh, Cambodia, Lao P.D.R., Mongolia, and Sri Lanka. Emerging Asian economies include Indonesia, Malaysia, the Philippines, and Thailand.

³ These and other results are from Ree (forthcoming).

Figure 4.3. Selected Asia: Workers Moving Abroad, January 2006–January 2011

(In thousands; 3-month moving average)

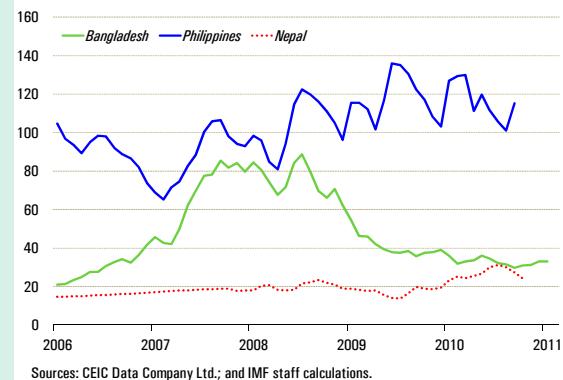


Figure 4.4. Selected Asia: Customer Deposit Growth
(Year over year; in percent)

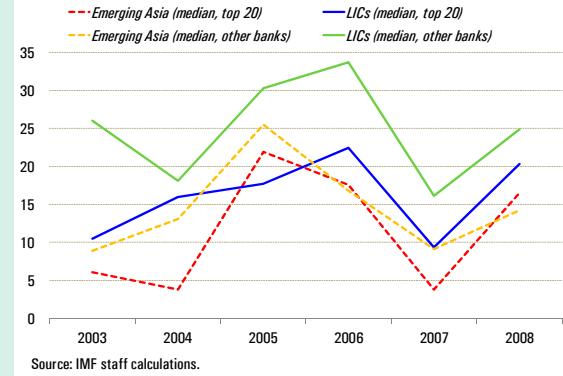
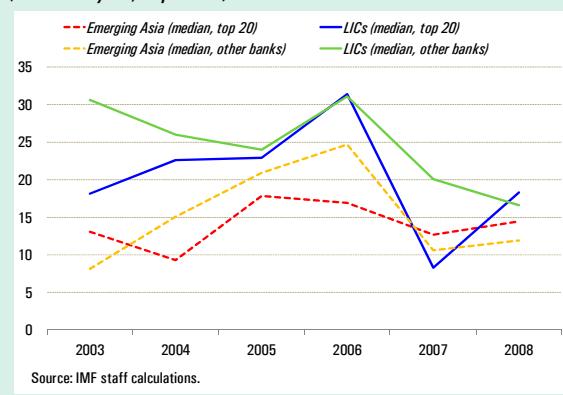


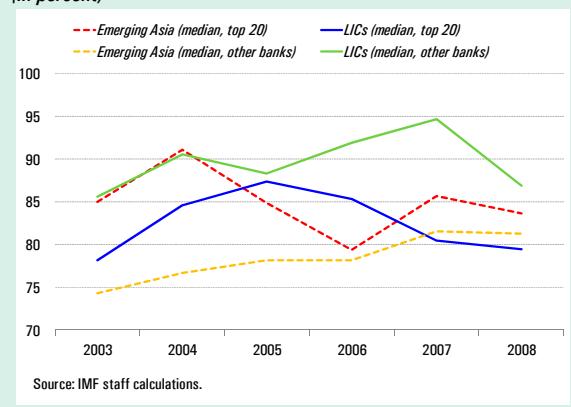
Figure 4.5. Selected Asia: Gross Loan Growth
(Year over year; in percent)



banks in both Asian LICs and emerging markets made substantial progress in reducing NPL ratios, cutting them on average from about 9 percent to about 4½ percent of gross loans. The trend continued after the crisis, as the median NPL ratio of Asian LIC banks was about 3 percent in 2009, compared with about 4 percent for Asian emerging market banks. That said, there is a nonnegligible cross-country difference among the Asian LICs, with NPL ratios relatively high in Sri Lanka (about 9 percent of loans) and Mongolia (about 7 percent of loans).

What explains the greater decline in bank lending growth in Asian LICs relative to emerging Asian economies? An important reason is that large banks in LICs entered the crisis with significantly high customer loan-to-deposit ratios (Figure 4.6). When the crisis occurred, and both deposits and cross-border bank flows declined, these banks cut lending sharply to build up liquidity cushions. In contrast, large banks in emerging Asia entered the crisis with significantly higher liquidity positions, as witnessed by the lower loan-to-deposit ratios in 2007 relative to 2004, partly the result of a shift of corporate financing toward capital markets. As they used this buffer in the crisis, banks in emerging Asia were able to cut lending growth by much less than their counterparts in Asian LICs.

**Figure 4.6. Selected Asia: Customer Loan-to-Deposit Ratio
(In percent)**



Overall, banking systems in Asian LICs are emerging from the crisis with limited damage to their balance sheets. At the same time, the crisis showed that banks in Asian LICs are also exposed to the risk of cross-border liquidity drying up, and that their liquidity management can amplify the cyclical dynamics of credit. Moreover, banking systems in these economies continue to suffer from structural weaknesses in banking supervision, the absence of financial safety nets, and an inappropriate judicial system for loan and collateral enforcement. Efforts should therefore continue toward strengthening macroprudential frameworks in these economies, particularly to firm up banking supervision and NPL resolution.

C. Timor-Leste: The Transition from Conflict to Development

After emerging from a long independence struggle and internal conflicts in 1999 and 2006, Timor-Leste authorities have made substantial progress toward restoring stability and rebuilding the country. Authorities are now finalizing an ambitious development strategy aimed at reducing poverty further and developing the non-oil economy to provide employment.

Timor-Leste became formally independent in 2002, making the territory the first new country of the twenty-first century. The outcome of the 1999 referendum to determine the territory's future status triggered a violent reaction by anti-independence forces, resulting in extensive loss of life and destruction of the majority of the country's infrastructure (including homes, the electric grid, irrigation and water supply systems, and schools). Moreover, more than three-fourths of the population was displaced. In 2006, tensions resurfaced when a military strike led to social disruption.

Despite the political tensions, the first decade of Timor-Leste's independence saw a significant rise in national income, thanks to petroleum. Petroleum income accounts for about 340 percent of non-oil GDP, as of 2010. Real gross national

income grew at an annual average of 27 percent, but was volatile because of swings in global oil prices. Non-oil GDP expanded over the decade at an annual average rate of 5 percent with large volatility, reflecting Timor-Leste's post-conflict status (Figure 4.7). High oil-financed government spending and a rebound in agriculture have supported strong non-oil GDP growth since 2007, averaging about 10 percent, but inflation has remained in single digits (Figure 4.8).

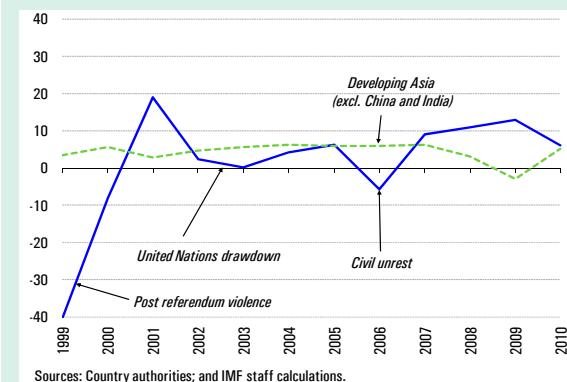
With the strong economic performance in the last few years, Timor-Leste has made substantial progress with poverty reduction and other social indicators for its population of 1 million. For example, a recent World Bank study (World Bank, 2009) indicates a sharp decline in poverty incidence from 50 percent in 2007 to 41 percent in 2009 owing to increased government spending on social protection programs and infrastructure projects. Moreover, the United Nations Development Programme 2010 *Human Development Report* ranks Timor-Leste at 120 out of 169 countries, compared with a ranking of 162 out of 182 countries in 2007. Despite these achievements, Timor-Leste remains one of the 48 least-developed countries.

The government has resolved to step up development. To rebuild basic infrastructure, such as electricity and roads, and promote private sector growth by scaling up public investment, the authorities are finalizing a Strategic Development Plan for 2011–30. The plan aims at growth of the non-oil economy at an average rate of 12 percent a year during 2011–20, and 10 percent a year during 2020–30. To improve the quality and prioritization of public investment, the government is planning to establish a new agency that will be responsible for project appraisal, design, and monitoring.

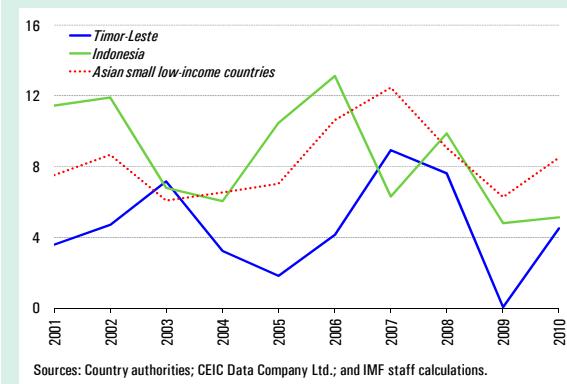
The outlook for the Timorese economy is promising. The economy stands to benefit enormously from its oil and gas wealth in the coming years, which is currently estimated at US\$24 billion or US\$22,000 per capita, and is expected to increase further in light of additional

reserves that have been discovered recently. Using this wealth for economic development will present some challenges, despite a transparent framework for the governance of the petroleum sector in place together with a well-managed Petroleum Fund.

**Figure 4.7. Timor-Leste: Real Non-oil GDP Growth
(Year over year; in percent)**



**Figure 4.8. Selected Asia: Consumer Price Inflation
(Year over year; in percent)**



The government is aware of the need to improve its institutional capacities and human resources to strengthen fiscal management (including public investment), taking into account the absorptive capacity of a small non-oil sector. These efforts, and other reforms, should be able to steer the economy to a path of sustainable, high growth with low inflation and improving living standards for the population of Timor-Leste. The IMF, together with other development partners, will continue to provide policy advice and technical assistance to help the authorities'

efforts to rebuild the country. Since late 1999, Timor-Leste has been one of the largest recipients of IMF technical assistance.

D. Pacific Island Countries: Vulnerabilities to Commodity Price Shocks

Recent developments in commodity markets are again drawing attention to how vulnerable PICs are to external price shocks. This section highlights why PICs are so vulnerable, notes the macroeconomic impact of commodity price shocks, and discusses measures to address the immediate impact of rising prices and reduce the vulnerability of PICs to price shocks in the long term.

Vulnerability to Shocks

The vulnerability of PICs to commodity price fluctuations stems from their small and open economies, remote locations, and high dependence on food and fuel imports. A narrow export base, reliance on tourism and workers' remittances for foreign exchange earnings, and gaps in social protection all serve to exacerbate this vulnerability.

- PICs are among the most vulnerable countries when it comes to the impact of oil price fluctuations (Asian Development Bank, 2009). Fuel imports are worth on average close to 10 percent of GDP, and oil makes up a greater share of the import bill and export proceeds than in low-income Asian countries that face similar challenges. Several PICs—Kiribati, Solomon Islands, and Tonga—rely almost entirely on imported oil for their commercial energy requirement and all others (except oil-producing Papua New Guinea) are heavily reliant on fuel imports. Dependence on oil is likely to remain high in the medium to long term as most non-oil-producing PICs have limited prospects for alternative energy sources.

- PICs are net importers of staple foods and depend heavily on imports of cereals and processed foods. Food comprises approximately 45 percent of their consumer price index baskets, placing them overall in a position similar to Asian LICs and well above the average for emerging market economies.
- These factors imply a high pass-through of oil and food prices to domestic inflation. In addition, fuel prices have a significant indirect impact on food prices owing to high transportation costs. Moreover, social protection systems in PICs are not well developed and the impact of commodity price increases on the more vulnerable members of society is potentially severe.

Macroeconomic Impact of Commodity Price Shocks

Because PICs are either dollarized or operate de jure or de facto pegged exchange rate regimes, there is limited scope for the exchange rate to act as a buffer for shocks. This means that the economic fallout of commodity price shocks generally consists of deteriorating current account balances, loss of reserves, higher domestic inflation rates, and a decline in household welfare. There are also potential impacts on the fiscal accounts, although these can counteract each other and depend largely on the policy response.

- The primary impact of high fuel and food prices is on the import bill (except for oil-producing Papua New Guinea). There is, nonetheless, evidence to suggest that oil import volumes decline in the face of higher prices. Although it is likely that the decline in Fiji partially reflects the slowdown in the domestic economy, Fiji's oil imports include a significant reexport component and can be taken to suggest a falloff in demand throughout the region.
- With PICs' narrow export bases and limited prospects to diversify their economies,

a sustained widening of their trade and current account deficits can be anticipated if oil and food prices remain high. Higher fuel prices may reduce the competitiveness of the tourism sector (for example, through flight costs) and this could worsen the deterioration in the current account through lower service receipts. Average PICs' current account deficits have widened to 8 percent of GDP since 2008 compared with an average of 6 percent of GDP between 2000 and 2007. The scope for PICs to finance large current account deficits on a sustained basis is limited as their reserves generally hover close to three to four months of imports—a level that is low for small and very open economies.

- Rising domestic inflation is another important consequence of higher international fuel and food prices. Inflation in PICs increased to an average of about 12 percent following the surges in food and fuel prices in 2007–08, up from an average of 4 percent from 2000 through 2007. The pass-through in PICs of international fuel prices to inflation was almost complete, with the average retail price of fuel closely tracking world prices (Figure 4.9). Food price inflation peaked in 2008, reaching more than 15 percent in Solomon Islands and Papua New Guinea. There was, however, less than full pass-through of higher food prices, in part because a number of PICs lowered tariffs on food (Marshall Islands and Solomon Islands) and introduced price controls (Fiji and Kiribati) (Figure 4.10).
- The fiscal impact varies across the PICs but, overall, government budgets have been under pressure. Higher prices, particularly for fuel, increase the cost of providing government services and may raise subsidies to, and contingent liabilities emanating from, state-owned enterprises (Marshall Islands and Micronesia). Although there can be some offsetting revenue gains, during the last price spike, policy decisions reduced this gain.

Samoa and the Marshall Islands reduced tax rates on petroleum products, and Tonga removed excise duties on oil for sea and air transport operators. In many parts of the world, fuel subsidies put pressure on expenditure, but this impact was not as severe in the PICs owing to the almost complete pass-through of international oil prices.

Figure 4.9. PICs: Pass-Through of Oil Prices to Inflation¹
(In percent)

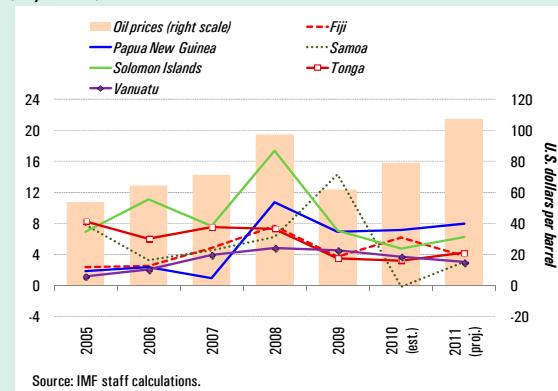
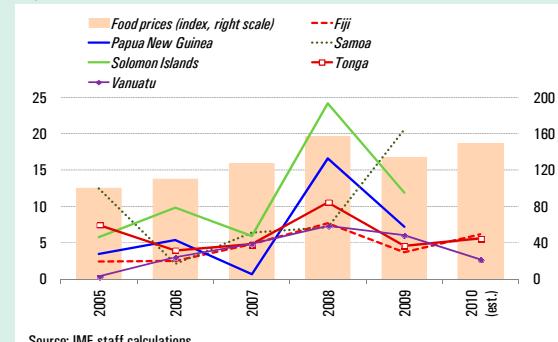


Figure 4.10. PICs: Pass-Through of Food Prices to Inflation¹
(In percent)



¹ Food only consumer price inflation for Papua New Guinea, Samoa, Solomon Islands, Tonga, and Vanuatu; and overall consumer price inflation for Fiji.

Policy Implications

Policymakers in the PICs face tension between mitigating the short-term impacts of commodity price shocks and laying the groundwork to reduce vulnerability. PICs' reliance on imported food and fuels, the cost efficiency of energy supply, and agricultural diversification have clear implications for macroeconomic management, but the scope

for solutions to these challenges is limited and time frames are likely to be long. Economic policy will therefore have to continue to manage the impacts of price movements. It can also contribute to management of supply and demand of energy and supply of food, and to mitigating the impact of price shocks on households and businesses. Key issues for macroeconomic managers in the PICs to consider are:

- Price signals are vital for macroeconomic stability, the success of any viable energy policy, and investment and growth (including agricultural diversification). Many of the PICs responded to the 2007–08 surges in food and fuel prices by introducing or increasing subsidies, lowering tariffs or sales taxes, and imposing price controls. These measures can help alleviate the impact of volatile prices on households but are often poorly targeted, place pressure on budgets, and can lead to lasting distortions. By suppressing price signals, they prevent demand from adjusting to supply conditions, dampen the volume response to higher import prices, exacerbate the negative impact on the external accounts, and discourage energy and investment efficiency. They can also have serious fiscal consequences through rising subsidies and contingent liabilities.
- Social protection is best achieved through transfers targeted to the neediest. General budget subsidies arising from controls on retail prices of fuel, electricity, and food generally benefit the rich far more than the poor. Better targeted transfers can provide more effective social protection at a lower fiscal cost and help reduce the pressure on the current account.
- Tax policy should balance the needs of consumers and the government budget. Reductions in consumption taxes (for example, value-added tax (VAT)) on selected goods to moderate the impact on consumers of high prices should be avoided as they

distort relative prices, complicate VAT administration, and have a similar impact on demand as price controls. Moderations in import duties create fewer distortions and are consistent with trade policy objectives.

Increases in taxation to discourage consumption, perhaps to take account of environmental consequences, are best achieved through specific excises.

Governments in PICs need not, however, rely too heavily on taxation of oil products for financing expenditure. Because demand for oil products in the PICs is quite inelastic, taxes designed to discourage consumption could have stark effects on the domestic private sector.

- Monetary and exchange rate policy should be used to control inflation.⁴ The immediate pass-through of a price shock (the “first-round” effect) can be accommodated, but monetary policy needs to remain vigilant against “second-round” effects. Price shocks will therefore often need to be followed by increases in interest rates to contain domestic demand, decrease inflation pressures, and help protect external reserves. In the medium term, appropriate exchange rate policies that avoid an overvalued exchange rate will contain the demand for imported fuels and help export performance.
- Long-term vulnerability can be partially addressed through the removal of price controls and subsidies, and the implementation of structural measures. Removing price controls and subsidies will encourage efficient use of imported fuels and greater self-sufficiency in both food and energy. The Asian Development Bank (2008) identifies a number of PICs as having potential for large increases in the production

⁴ Capital flows are limited in the PICs; thus monetary policy retains a certain degree of freedom even in those countries that have their own currency and a pegged exchange rate regime.

of staples (Fiji, Micronesia, Papua New Guinea, Samoa, Solomon Islands, Tonga, and Vanuatu). Currently, Fiji, Samoa, and Papua New Guinea meet approximately one-third to one-half of their electricity needs from hydroelectric systems, and further exploration of alternative energy sources could help reduce dependence on imported oil for electricity needs. In Fiji, increases in electricity tariffs during the past year should allow the Fiji Electricity Authority to attract renewable energy investment to feed the power grid.

Other growth-supporting structural measures such as land reform, investment in internal transportation infrastructure (so that domestic produce can be brought to urban markets), competitive bidding for gasoline distribution (as, for example, in Samoa), the removal of import monopolies (such as for rice by the Solomon Islands in 2009), and simplifying procedures for the establishment and operation of private enterprises can also reduce the vulnerability of the PICs to international commodity price shocks.

References

- Ahmed, S., 2009, “Are Chinese Exports Sensitive to Changes in the Exchange Rate?” International Finance Discussion Papers No. 987 (Washington: Board of Governors of the Federal Reserve System).
- Altunbas Y., L. Gambacorta, and D. Marqués-Ibáñez, 2010, “Does Monetary Policy Affect Bank Risk-Taking?” ECB Working Paper No. 1166 (Frankfurt: European Central Bank).
- Angeloni, I., and E. Faia, 2009, “A Tale of Two Policies: Prudential Regulation and Monetary Policy with Fragile Banks,” Kiel Working Paper 1569 (Kiel, Germany: Kiel Institute for the World Economy).
- _____, and M. Lo Duca, 2010, “Monetary Policy and Risk Taking,” Bruegel Working Paper (Brussels: Bruegel).
- Asian Development Bank, 2008, “Living with High Prices: A Policy Brief,” Pacific Studies Series (Manila: Asian Development Bank).
- _____, 2009, “Taking Control of Oil: Managing Dependence on Petroleum Fuels in the Pacific,” Pacific Studies Series (Manila: Asian Development Bank).
- Aysun, U., and A. Honig, 2010, “Bankruptcy Costs, Liability Dollarization, and Vulnerability to Sudden Stops,” *Journal of Development Economics*, article in press.
- Bank for International Settlements, 2008, “Addressing Financial System Procyclicality: A Possible Framework,” note for the Financial Stability Forum Working Group on Market and Institutional Resilience (September). (Geneva: Bank for International Settlements).
- _____, 2010, “Group of Central Bank Governors and Heads of Supervision Reinforces Basel Committee Reform Package,” BIS press release (January 11). (Geneva: Bank for International Settlements).
- Bank of England, 2009, “The Role of Macroprudential Policy,” Bank of England Discussion Paper, November (London: Bank of England).
- Bernanke, B., M. Gertler, and S. Gilchrist, 1999, “The Financial Accelerator in a Quantitative Business Cycle Framework,” *Handbook of Macroeconomics*, Vol. 1C, Chapter 21, ed. by J.B. Taylor and M. Woodford (Amsterdam: North-Holland).
- Borgy, V., L. Clerc, and J. P. Renne, 2009, “Asset-Price Boom-Bust Cycles and Credit: What Is the Scope of Macro-Prudential Regulation?” Working Paper No. 263 (Paris: Bank of France).
- Borio, C., and M. Drehmann, 2009, “Assessing the Risk of Banking Crises—Revisited,” *BIS Quarterly Review* (March), pp. 29–46.
- Borio, C.E.V., and P.W. Lowe, 2002, “Asset Prices, Financial and Monetary Stability: Exploring the Nexus,” Working Paper No. 114 (Basel: Bank for International Settlements).
- Borio, C.E.V., and H. Zhu, 2008, “Capital Regulation, Risk-Taking and Monetary Policy: A Missing Link in the Transmission Mechanism?” BIS Working Paper No. 268 (Basel: Bank for International Settlements).
- Borrus, M., D. Ernst, and S. Haggard, 2000, *International Production Networks in Asia* (London: Routledge).

REGIONAL ECONOMIC OUTLOOK: ASIA AND PACIFIC

- Chinn, M.D., and H. Ito, 2008, “A New Measure of Financial Openness,” *Journal of Comparative Policy Analysis*, Vol. 10, No. 3 (September), pp. 309–22.
- Christiano, L.J., M. Eichenbaum, and C.L. Evans, 1996, “The Effects of Monetary Policy Shocks: Evidence from the Flows of Funds,” *Review of Economics and Statistics*, Vol. 78, pp. 16–34.
- Craig, R., E. Davis, and A. Pascual, 2006, “Sources of Procyclicality in East Asian Financial Systems,” in S. Gerlach and P. Gruenwald (eds.), *Procyclicality of Financial System in Asia* (New York: Palgrave MacMillan).
- Eichengreen, B., Y. Rhee, and H. Tong, 2007, “China and the Exports of Other Asian Countries,” *Review of World Economics*, Vol. 143, No. 2, pp. 201–26.
- Elekdag, S., and I. Tchakarov, 2007, “Balance Sheets, Exchange Rate Policy, and Welfare,” *Journal of Economic Dynamics & Control*, Vol. 31, pp. 3986–4015.
- Felman, J., M. Goswami, S. Gray, A. Jobst, S. Peiris, M. Pradhan, and D. Seneviratne, 2010, “ASEAN5 Bond Market Development: Where Does It Stand? Where Is It Going?” IMF staff paper presented at the Seminar Fostering ASEAN Bond Markets (Washington: International Monetary Fund).
- Forni, M., M. Hallin, M. Lippi, and L. Reichlin, 2005, “The Generalized Dynamic Factor Model: One-Sided Estimation and Forecasting,” *Journal of the American Statistical Association*, No. 100, pp. 830–40.
- Gagnon, J., M. Riskin, J. Remache, and B. Sack, 2010, “Large-Scale Asset Purchases by the Federal Reserve: Did They Work?” Federal Reserve Bank of New York Staff Report No. 441 (New York: Federal Reserve Bank of New York).
- García-Herrero, A., and E. Remolona, 2008, “Managing Expectations by Words and Deeds: Monetary Policy in Asia and the Pacific,” paper presented at the BSP-BIS High-Level Conference on Transparency and Communication in Monetary Policy, February 1 (Manila, Philippines)..
- Gaulier, G., F. Lemoine, and D. Ünal-Kesenci, 2005, “China’s Integration in East Asia: Production sharing, FDI, and High-Tech Trade,” CEPII Working Paper No. 2005–09 (Paris: CEPII).
- Gerdesmeier, D., B. Roffia, and H.E. Reimers, 2009, “Monetary Developments and Asset Prices,” Working Paper No. 1068 (Frankfurt: European Central Bank).
- Gertler, M., S. Gilchrist, and F. Natalucci, 2007, “External Constraints on Monetary Policy and the Financial Accelerator,” *Journal of Money, Credit and Banking*, Vol. 39, pp. 295–330.
- Goldstein, M., and Mohsin S. Khan, 1985, “Income and Price Effects in Foreign Trade,” in Ronald W. Jones and Peter B. Kenen, *Handbook of International Economics*, Vol. 2, pp. 1041–1105 (Amsterdam: Elsevier).
- Gray, S., A. Carjaval, and A. Jobst, 2010, “Developing Domestic Bond Markets: What Still Needs to Be Done?” IMF paper presented at the 3rd Joint Seminar of ASEAN Deputies: Fostering ASEAN Bond Markets (November 5).
- Hummels, D., J. Ishii, and K. Yi, 2001, “The Nature and Growth of Vertical Specialization in World Trade,” *Journal of International Economics*, Vol. 54 (June), pp. 75–96.

- Hunt, B., 2010, "Emerging Asia's Impact on Australian Growth: Some Insights from GEM," IMF Working Paper No. 10/262 (Washington: International Monetary Fund).
- Ingves, S., 2011, "Challenges for the Design and Conduct of Macroprudential Policy," a speech at the Bank of Korea–Bank for International Settlements (BOK-BIS) Conference on Macroprudential Regulation and Policy, Seoul, January 18.
- International Monetary Fund, 2007a, *Regional Economic Outlook: Asia and Pacific* (Washington, October).
- , 2007b, *World Economic Outlook* (Washington, October).
- , 2008, *Regional Economic Outlook: Asia and Pacific* (Washington, April).
- , 2010a, *Global Financial Stability Report*, (Washington, April).
- , 2010b, *Regional Economic Outlook: Asia and Pacific* (Washington, April).
- , 2010c, *Regional Economic Outlook: Asia and Pacific* (Washington, October).
- , 2011a, "Macroprudential Policy: An Organizing Framework," background paper prepared by the IMF's Monetary and Capital Markets Department (Washington, March). Available via the Internet: <http://www.imf.org/external/np/pp/eng/2011/031411a.pdf>.
- , 2011b, *World Economic Outlook* (Washington, April).
- Japan External Trade Organization, 2006, Asian International Input-Output Table 2000, (Tokyo: March).
- Jiménez, G., S. Ongena, J. Peydrò, and J. Saurina, 2010, "Hazardous Times for Monetary Policy: What Do Twenty-Three Million Bank Loans Say About the Effects of Monetary Policy on Credit Risk-Taking?" Bank of Spain, Working Papers, No. 833 (Madrid: Bank of Spain).
- Johansson, F., 2006, "Chinese Export of Electrical Machinery Equipments: An Estimated Demand Function" (Jönköping: Internationella Handelshögskolan).
- Kannan, P., P. Rabanal, and A. Scott, 2009, "Macroeconomic Patterns and Monetary Policy in the Run-Up to Asset Price Busts," IMF Working Paper 09/252 (Washington: International Monetary Fund).
- Kawai, M., and G. Wignaraja, 2011, *Asia's Free Trade Agreements: How Is Business Responding?* (Cheltenham: Edward Elgar Press).
- Kim, S., 1999, "Do Monetary Policy Shocks Matter in the G-7 Countries? Using Common Identifying Assumptions about Monetary Policy Across Countries," *Journal of International Economics*, Vol. 48, pp. 387–412.
- Kimura, F., and M. Ando, 2005, "Two-Dimensional Fragmentation in East Asia: Conceptual Framework and Empirics," *International Review of Economics and Finance*, Vol. 14, No. 3, pp. 317–48.
- Kohn, D., 2008, "Monetary Policy and Asset Prices Revisited," speech at the Cato Institute's Annual Monetary Policy Conference (Washington: Cato Institute).
- Koopman, R., Z. Wang, and S.-J. Wei, 2008, "How Much of Chinese Exports Is Really Made in China? Assessing Domestic Value-Added When Processing Trade Is Pervasive," NBER Working Paper No. 14109 (Cambridge, Massachusetts: National Bureau of Economic Research).

- Koopman, R., W. Powers, Z. Wang, and S. Wei, 2010. "Give Credit Where Credit Is Due: Tracing Value Added in Global Production Chains," NBER Working Paper No. 16426 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Lange, R., 2005, "Determinants of the Long-Term Yield in Canada: An Open Economy VAR Approach," *Applied Economics*, Vol. 37, pp. 681–93.
- Milberg, W., and D. Winkler, 2010, "Trade Crisis and Recovery: Restructuring of Global Value Chains," World Bank Policy Research Working Paper No. 5294 (Washington: World Bank).
- Mishkin, F. S., 2007, "The Transmission Mechanism and the Role of Asset Prices in Monetary Policy," in *Monetary Policy Strategy*, ed. by F.S. Mishkin (Cambridge: MIT Press).
- Mohanty, M. S., and P. Turner, 2008, "Monetary Policy Transmission in Emerging Market Economies: What Is New?" in *Transmission Mechanisms for Monetary Policy in Emerging Market Economies*, BIS Papers No. 35, pp. 1–59 (Basel: Bank for International Settlements).
- Mohammad, A., P. N'Diaye, and O. Unteroberoerser, 2011, "Rebalancing Growth in Asia," in *Rebalancing Growth in Asia: Economic Dimensions for China*, ed. by V. Arora and R. Cardarelli (Washington: International Monetary Fund).
- Moreno, R., 2008, "Monetary Policy Transmission and Long-Term Interest Rate in Emerging Markets," in *Transmission Mechanisms for Monetary Policy in Emerging Market Economies*, BIS Papers No. 35 (Basel: Bank for International Settlements)
- Murshed, M., 2001, "Patterns of East Asian Trade and Intra-Industry Trade in Manufacturers," *Journal of the Asia Pacific Economy*, Vol. 6, No. 1, pp. 99–123.
- N'Diaye, P., 2009, "Countercyclical Macro Prudential Policies in a Supporting Role to Monetary Policy," IMF Working Paper 09/257 (Washington: International Monetary Fund).
- Neely, C., 2010, "The Large-Scale Asset Purchases Had Large International Effects," Federal Reserve Bank of St. Louis Working Paper No. 2010-018C. Available via the Internet:
<http://research.stlouisfed.org/wp/2010/2010-018.pdf>
- Ostry, J.D., A.R. Ghosh, K. Habermeier, L. Laeven, M. Chamon, M. S. Qureshi, and D.B.S. Reinhardt, 2010, "Capital Inflows: The Role of Controls," IMF Staff Position Note 10/04 (Washington: International Monetary Fund).
- Ostry, J.D., A. R. Ghosh, K. F. Habermeier, L. Laeven, M. Chamon, M.S. Qureshi, and A. Kokene, 2011, "Managing Capital Inflows: What Tools to Use?" IMF Staff Discussion Note 11/06 (Washington: International Monetary Fund).
- Ozkan, G., and D.F. Unsal, 2010, "External Finance, Sudden Stops, and Financial Crisis: What Is Different this Time?" IMF Working Paper 10/158 (Washington: International Monetary Fund).
- Peiris, S. J., 2010, "Foreign Participation in Emerging Markets' Local Currency Bond Markets," IMF Working Paper 10/88 (Washington: International Monetary Fund).
- Powers, W., Z. Wang, and S. Wei, 2009, "Value Chains in East Asian Production Networks," USITC Working Paper No. 2009–10–C (October).

- Pradhan, M., R. Balikrishnan, R. Baqir, G. Heenan, S. Nowak, C. Oner, and S. Panth, 2011, "Policy Responses to Capital Flows in Emerging Markets," paper presented at the Bank of Indonesia and IMF Joint Conference on Coping With Asia's Large Capital Inflows in a Multi-Speed Global Economy (Washington: International Monetary Fund).
- Pula, G. and T. A. Peltonen, 2009, "Has Emerging Asia Decoupled? An Analysis of Production and Trade Linkages Using the Asian International Input-Output Table," ECB Working Paper No, 993 (Frankfurt: European Central Bank).
- Ree, J., forthcoming, "Impact of the Global Crisis on Banking Sector Soundness in Asian LICs," IMF Working Paper (Washington: International Monetary Fund).
- Sun, Y., forthcoming, "From West to East: Estimating External Spillovers to Australia and New Zealand," IMF Working Paper.
- Thorbecke, W., 2010, "Investigating the Effect of Exchange Rate Changes on China's Processed Exports," Asian Development Bank Institute Conference Paper (November).
- _____, and G. Smith, 2008, "How Would an Appreciation of the RMB and Other East Asian Currencies Affect China's Exports?" *Review of International Economics*, Vol. 18, No. 1, pp. 95–108.
- United Nations Development Programme, 2010, *Human Development Report 2010* (New York: Palgrave McMillan).
- Warnock, F., and V. C. Warnock, 2009, "International Capital Flows and U.S. Interest Rates," *Journal of International Money and Finance*, Vol. 28, No. 6, pp. 903–19.
- World Bank, 2009, "A 2009 Update of Poverty Incidence in Timor-Leste Using the Survey-to-Survey Imputation Method." Available via the Internet:
<http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/TIMORLESTEEXTN/0,contentMDK:22703761~menuPK:294027~pagePK:2865066~piPK:2865079~theSitePK:294022,00.html>



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