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Regional Economic Outlook

Asia and Pacific

Stabilizing and Outperforming Other Regions

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Editor's Note: Figure 1.3.1 on page 36 has been updated since release of this publication. The legends for pre–global financial crisis credit intensity (2004–07) and post–global financial crisis credit intensity (2010–13) erroneously appeared as pre–global financial crisis debt to equity (2004–07) and post–global financial crisis debt to equity (2010–13). The corrected chart now appears on page 36.

Definitions

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

- "ASEAN" refers to Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam, unless otherwise specified.
- "ASEAN-5" refers to Indonesia, Malaysia, the Philippines, Singapore, and Thailand.
- "Advanced Asia" refers to Australia, Hong Kong SAR, Japan, Korea, New Zealand, Singapore, and Taiwan Province of China.
- "Emerging Asia" refers to China, India, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam.
- "Frontier and Developing Asia" refers to Bangladesh, Cambodia, Lao People's Democratic Republic, Mongolia, Myanmar, Nepal, and Sri Lanka.
- "Asia" refers to ASEAN, East Asia, Advanced Asia, South Asia, and other Asian economies.
- "EU" refers to the European Union.
- "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, the Republic of Korea, Mexico, the Russian Federation, Saudi Arabia, South Africa, Turkey, the United Kingdom, and the United States.

The following abbreviations are used:

ASEAN	Association of Southeast Asian Nations
BMA	Bayesian model averaging
BIS	Bank for International Settlements
CDIS	Coordinated Direct Investment Survey
CPI	consumer price index
CPIS	Coordinated Portfolio Investment Survey
DFD	distance to final demand
DSGE	dynamic stochastic general equilibrium
DVA	domestic value added
ECI	economic complexity index
FCI	financial conditions index
FDI	foreign direct investment
FSI	Financial Soundness Indicators
FX	foreign exchange
GDP	gross domestic product
GFCF	gross fixed capital formation
GMM	generalized method of moments
GVC	global value chains
IS	Investment Saving
LICs	low-income countries
NAFTA	North American Free Trade Agreement
OECD	Organisation for Economic Co-operation and Development
PICs	Pacific Island countries

QQE	quantitative and qualitative easing
R&D	research and development
RCF	Rapid Credit Facility
REER	real effective exchange rate
RFI	rapid financing investment
SOI	Southern Oscillation Index
TFP	total factor productivity
UNCTAD	United Nations Conference on Trade and Development
VAR	vector autoregression
VIX	Chicago Board Options Exchange Market Volatility Index
WEO	World Economic Outlook
WTO	World Trade Organization

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.
- In figures and tables, shaded areas show IMF projections.
- 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 ¼ 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 Rachel van Elkan of the IMF's Asia and Pacific Department, under the overall direction of Chang Yong Rhee and Markus Rodlauer. Contributors include Nasha Ananchotikul, Elif Arbatli, Paul Cashin, Kevin Cheng, Mali Chivakul, Jaime Guajardo, Roberto Guimarães-Filho, Gee Hee Hong, Joong Shik Kang, Yuko Kinoshita, Vladimir Klyuev, Christiane Kneer, Waikei Raphael Lam, Xiaoguang Liu, Wojciech Stanislaw Maliszewski, Kum Hwa Oh, Shi Piao, Mehdi Raissi, Jack Ree, Sidra Rehman, Dulani Seneviratne, Alfred Schipke, Yiqun Wu, Longmei Zhang, Shiny Zhang, and Edda Zoli. Shi Piao and Dulani Seneviratne provided research assistance. Luisa Calixto and Socorro Santayana provided production assistance. Rosanne Heller, former IMF Asia and Pacific Department editor, and Joanne Creary Johnson of the IMF's Communications Department edited the report. Joanne Creary Johnson coordinated its production and release, with the assistance of Katy Whipple. This report is based on data available as of April 2 and includes comments from other departments and some executive directors.

Executive Summary

The economic outlook for Asia and the Pacific remains favorable, with the region projected to remain the global growth leader over the medium term. While the pace of expansion has moderated since the global financial crisis, robust consumption helped to cushion the blow from weaker external demand. As a region of oil importers and supply chain participants, Asia is set to benefit from the recent decline in world oil prices and the ongoing recovery in advanced economies. However, real and financial volatilities could disrupt this favorable outlook, and further delays in structural reforms could hold back growth. Therefore, policies should remain focused on building resilience and enhancing productive capacity.

Growth in the Asia and Pacific region is expected to hold steady at 5.6 percent in 2015 and to ease slightly to 5.5 percent in 2016. Domestic demand is forecast to continue to drive growth, supported by the windfall boost to real incomes from lower world oil prices and strong labor market conditions. These factors are expected to offset the effect of tighter financial conditions from capital flow reversals triggered in part by the prospect of monetary tightening by the Federal Reserve. Net exports are also expected to add only marginally to growth. Across the region, lower oil prices will temporarily push down headline inflation and, with a large part of the windfall expected to be saved, current account balances will increase.

Nonetheless, considerable heterogeneity is apparent across the region. China is slowing to a more sustainable pace; Japan is expected to see growth pick up following a year of stagnation; exporters of non-oil commodities whose prices have fallen sharply (Australia, Indonesia, Malaysia, and New Zealand) will be adversely affected by the terms-of-trade swing; elsewhere, however, growth is expected to stabilize or increase. In addition, effective exchange rates across the region have diverged, reflecting several factors: (1) in the context of asynchronous monetary policies in major advanced economies, including Japan, some currencies have remained more closely tied to the U.S. dollar, while others have allowed more flexibility; (2) the differential impact of large changes in the terms of trade on net commodity importers and exporters; and (3) capital is flowing into some countries but reversing from others. This regional diversity could lead to increased volatility.

While the Asia and Pacific outlook remains solid, the balance of risks is tilted to the downside. First, significantly slower-than-expected growth in China or Japan would impact the rest of the region and the world given these economies' large size and deep trade and financial linkages. Countries with strong supply chain linkages as well as commodity exporters to these large economies would be especially affected. Second, persistent U.S. dollar strength against the euro and the yen would likely exert an autonomous tightening of domestic financial conditions in the region and impose higher debt service costs for firms with sizable U.S.-dollar-denominated debt. In addition, a stronger dollar relative to other major currencies could erode export market shares for economies whose currency displays limited flexibility against the U.S. dollar. Third, the rapid buildup of debt across the region could heighten the sensitivity of growth to global financial and inflation conditions. Tighter financial conditions in the United States would raise domestic borrowing costs, while lower global inflation—if imported into Asia—would increase the level of real debt. The resulting increase in the carrying cost of debt could impinge on domestic spending, while higher debt could weaken the credit channel of monetary policy.

(*continued*)

On the other hand, lower world oil prices present an important upside risk for Asia's growth. Notwithstanding the projected increase in the world price beginning later this year, over the longer term oil prices are expected to remain significantly below the average of recent years. Additional support to growth could materialize if the supply contribution to the price decline is larger or more persistent than currently envisaged, or if the propensity to spend from the oil price windfall is larger than currently anticipated.

While debt has risen across much of Asia and the Pacific, reaching high levels in some economies, financial sector risks have been contained by sustained income growth and supportive financial conditions. However, risks are evident in the real estate sector, and although bank credit-to-GDP ratios have been increasing more slowly in most economies, previous rapid credit growth has generated sizable positive credit gaps in several economies. Notwithstanding these developments, banks' balance sheets have generally strengthened across Asia and the Pacific.

Going forward, Asia's pace of potential growth is likely to remain below precrisis levels. Mirroring developments in realized growth, potential growth has slowed across much of the region. The decline reflects primarily decelerating total factor productivity, although slower growth in labor's contribution due to aging was a major factor in several economies. Slower total factor productivity growth may reflect diminishing returns from participating in global value chains (see Chapter 2), which could limit productivity gains in the absence of structural reforms. Over the medium term, the region would also benefit from deeper regional financial integration, which has lagged trade integration (see Chapter 3). Furthering financial integration holds the promise of more efficient allocation of regional savings to meet the region's large investment needs while also supporting financial inclusion.

What is the role for policy in this environment? Most countries in Asia and the Pacific are in the enviable position of having adequate interest rate and fiscal policy space to supply additional temporary stimulus if needed. However, based on growth and inflation forecasts, current policy interest rates are appropriate across the region, although concerns about fiscal sustainability and financial stability, as well as the risk of renewed global financial volatility, may warrant somewhat tighter stances in several countries. Moreover, policymakers will also need to contend with several countervailing forces, including the temporary fall and subsequent increase in the price of oil, potential capital flow volatility, and rising asset prices. Macroprudential policies and foreign currency intervention can assist to contain financial stability risks and address sporadic disorderly conditions in the foreign exchange market, but permitting exchange rate flexibility to absorb shocks. On the fiscal front, the decline in oil and food prices provides a window of opportunity to further reform or phase out subsidies, thereby improving spending efficiency and shielding public spending from future commodity price fluctuations. Further fiscal consolidation is appropriate in countries where public debt remains elevated. Structural reforms remain critical to boost productivity growth across the region, including state-owned enterprise and financial sector reforms in China, initiatives to raise services productivity and labor force participation in Japan, and measures to address supply bottlenecks in India, the Association of Southeast Asian Nations, frontier economies, and small states.

1. Asia and Pacific's Outlook: Still Leading Global Growth

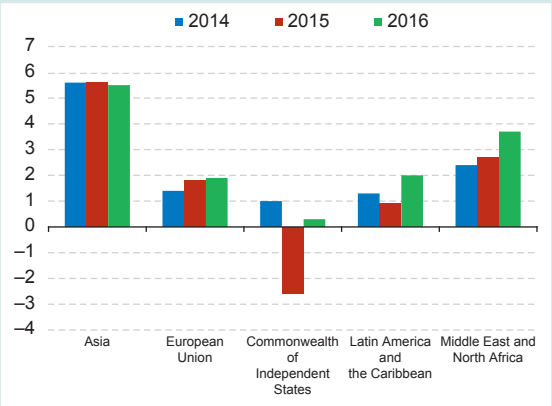
Asia and Pacific's position as the growth engine of the world economy has intensified in recent years. While in 2000 the region accounted for less than 30 percent of world output, by 2014 this contribution had risen to almost 40 percent. Moreover, Asia and Pacific accounted for nearly two-thirds of global growth last year. Developments in the region are therefore central to the global economic outlook and for formulating policies around the world. What, then, are Asia and Pacific's near- and medium-term growth prospects? Will substantial intraregional differences in growth persist? How have vulnerabilities within the region evolved? What macroeconomic, financial, and structural policies are appropriate to ensure a dynamic and resilient Asia and Pacific economic region? This chapter addresses these questions, beginning from the broader perspective of the global backdrop and associated risks, as reflected in the April 2015 World Economic Outlook *(WEO).*

Global Backdrop and Major Risks

Global growth remains moderate and uneven. Growth reached 3.3 percent in 2014, broadly in line with the October 2014 WEO projections. Nonetheless, this masks growth surprises in the second half of the year that point to a widening divergence among the major economies. The U.S. recovery was stronger than expected, but economic performance in many other parts of the world fell short of expectations. Specifically, the U.S. economy grew at an annualized rate in excess of 4 percent in the last three quarters of 2014 as consumption benefited from steady job creation, lower oil prices, and improved consumer confidence. However, activity in the euro area during the middle part of the year was considerably weaker than expected, although some rebound has been evident since the fourth quarter of 2014, with consumption supported by lower oil prices and higher net exports. Growth continues to decelerate in emerging markets, particularly Brazil, China, Russia, and South Africa. The sharp drop in oil prices since mid-2014 has also affected oil exporters (Figure 1.1).

World growth is projected to pick up modestly to 3.5 percent in 2015 and to 3.7 percent in 2016. Advanced economies are expected to strengthen, led by the United States, although the increase is seen as broad based, underpinned by accommodative monetary policies and lower oil prices. But growth in emerging markets is forecast to dip temporarily lower in 2015 as several large commodity exporters (including Nigeria, Russia, and Saudi Arabia) are adversely affected by the deteriorating terms of trade. China continues to transition from investment-led growth, and private sector sentiment remains stubbornly weak in Brazil. Growth in low-income and developing countries is also projected to soften temporarily this year. Despite the expected sequential pickup in world growth, the forecast nonetheless reflects a downward revision of 0.3 percentage point for 2015 relative to the October 2014 WEO. The markdown primarily reflects a reassessment of

Figure 1.1
Real GDP Growth
(Year-over-year percent change)



Source: IMF, World Economic Outlook database.

Note: The authors of this chapter are Roberto Guimarães-Filho and Rachel van Elkan. Shi Piao and Dulani Seneviratne provided research assistance.

prospects for large emerging market economies and for some major oil exporters. In contrast, the outlook for advanced economies is showing signs of improvement.

Inflation is projected to decline across the board in 2015, primarily reflecting the impact of lower oil prices, with moderate reflation thereafter. While inflation declined recently, mainly because of lower world oil prices, inflation has been generally low in advanced economies, owing to persistent excess capacity. In the euro area, inflation has remained well below the European Central Bank's objective and dropped further to –0.2 percent (year over year) in December 2014. Moreover, several economies saw mild deflation for several quarters even before the drop in oil prices, reflecting high unemployment and slack in the labor market. Headline inflation is also declining in emerging markets, reflecting both the slowdown in activity and lower oil prices, although the pass-through of world oil prices to end users has been delayed or limited in several countries. In addition, exchange rate movements are noticeably affecting inflation in some countries, with appreciation in China dampening inflation and depreciation in Brazil, Russia, South Africa, and Turkey amplifying it. Global factors, including commodity prices and the path of the dollar, are expected to continue playing an important role in individual countries' price developments, helping to push up inflation in 2016, but country-specific factors will remain important inflation drivers in many instances.

The distribution of risks to global growth is now more balanced than at the time of the October 2014 WEO, but still tilted to the downside. Specifically, downside risks have moderated given the lower baseline path for growth in emerging markets, while additional support to demand from low oil prices is an important upside risk. Several previously identified risks also remain relevant:

- *Low oil prices present a two-sided risk.* On the downside, oil prices could rebound faster than expected if supply is curtailed more quickly in response to lower prices, withdrawing support for demand. On the upside, the demand impulse from the boost to real incomes from the oil price windfall could be stronger than currently anticipated.
- *A disruptive increase in financial volatility could occur.* While financial market volatility remains very low from a historical perspective, anticipation of the interest rate tightening cycle in the United States—the timing and speed of which is uncertain—could induce sharp movements in term premiums and risk spreads in advanced and emerging market economies.
- *Persistent dollar strength against the euro and the yen.* Sustained realignments of the major reserve currencies brought about by differences in cyclical positions and asynchronous monetary policies could pose a growth risk through trade and balance sheet channels.
- *Protracted low inflation or deflation could weigh on growth* if it leads to widespread postponement of spending, including through its impact on real debt burdens. Abstracting from the effects of temporarily lower oil prices, the April 2015 WEO finds that the probability of deflation—defined as a price-level decline in a four-quarter window—as a result of negative shocks to activity is close to 30 percent for the euro area, but well below 10 percent for other economies and regions (about 2 percent for emerging Asia and 7 percent for Japan).
- *Geopolitical risks* in several regions could disrupt trade in commodities and financial transactions.

Asia and Pacific: Main Themes for 2015

While remaining the world's growth leader, Asia and the Pacific saw slightly less growth in 2014, responding to the drag from within and outside the region. GDP growth decelerated last year to 5.6 percent, against 5.9 percent in 2013 (Table 1.1 and Annex 1.1). While growth picked up across much of the region, slowing growth in several large economies, including China,

Table 1.1. Asia: Real GDP
(Year-over-year percent change)

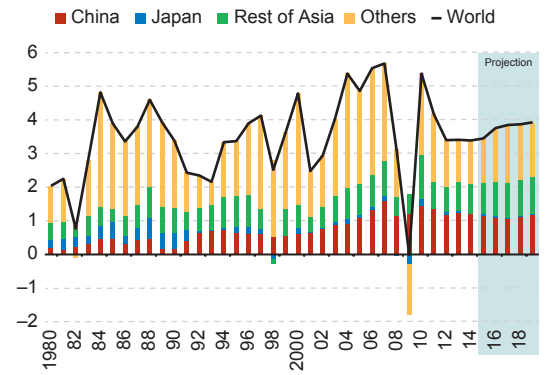
	Actual Data and Latest Projections					Difference from October 2014 WEO		
	2012	2013	2014	2015	2016	2014	2015	2016
Australia	3.6	2.1	2.7	2.8	3.2	–0.1	–0.1	0.1
Japan	1.8	1.6	–0.1	1.0	1.2	–1.0	0.2	0.3
New Zealand	2.4	2.2	3.2	2.9	2.7	–0.4	0.1	0.3
East Asia	**6.8**	**6.9**	**6.7**	**6.3**	**5.9**	**–0.1**	**–0.3**	**–0.5**
China	7.8	7.8	7.4	6.8	6.3	0.0	–0.3	–0.5
Hong Kong SAR	1.7	2.9	2.3	2.8	3.1	–0.7	–0.4	–0.4
Korea	2.3	3.0	3.3	3.3	3.5	–0.4	–0.7	–0.5
Taiwan Province of China	2.1	2.2	3.7	3.8	4.1	0.3	0.0	–0.1
South Asia	**5.2**	**6.9**	**7.1**	**7.4**	**7.4**	**1.4**	**1.0**	**0.9**
Bangladesh	6.3	6.1	6.1	6.3	6.8	–0.1	–0.1	0.0
India[1]	5.1	6.9	7.2	7.5	7.5	1.5	1.1	1.0
Sri Lanka	6.3	7.3	7.4	6.5	6.5	0.4	0.0	0.0
ASEAN	**5.9**	**5.2**	**4.6**	**5.1**	**5.3**	**–0.1**	**–0.2**	**–0.1**
Brunei Darussalam	0.9	–1.8	–0.7	–0.5	2.8	–6.0	–3.5	–0.6
Cambodia	7.3	7.4	7.0	7.2	7.2	–0.2	–0.1	–0.1
Indonesia	6.0	5.6	5.0	5.2	5.5	–0.1	–0.3	–0.3
Lao People's Democratic Republic	7.9	8.0	7.4	7.3	7.8	0.0	0.1	0.2
Malaysia	5.6	4.7	6.0	4.8	4.9	0.1	–0.4	–0.1
Myanmar	7.3	8.3	7.7	8.3	8.5	–0.8	–0.2	0.3
Philippines	6.8	7.2	6.1	6.7	6.3	–0.1	0.4	0.3
Singapore	3.4	4.4	2.9	3.0	3.0	0.0	0.0	0.1
Thailand	6.5	2.9	0.7	3.7	4.0	–0.3	–0.9	–0.4
Vietnam	5.2	5.4	6.0	6.0	5.8	0.5	0.4	0.1
Pacific island countries and other small states[2]	**3.3**	**2.2**	**3.6**	**4.0**	**3.4**	**0.4**	**–0.5**	**0.2**
Emerging Asia[3]	**6.8**	**7.1**	**6.8**	**6.6**	**6.4**	**0.3**	**0.0**	**–0.1**
Asia	**5.6**	**5.9**	**5.6**	**5.6**	**5.5**	**0.1**	**0.0**	**–0.1**

Sources: IMF, World Economic Outlook (WEO) database; and IMF staff calculations.
Note: ASEAN = Association of Southeast Asian Nations.
[1] For India, data and forecasts are presented on a fiscal-year basis and output growth is based on GDP at market prices.
[2] Simple average for Pacific island countries and other small states which comprise Bhutan, Fiji, Kiribati, Maldives, the Marshall Islands, Micronesia, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor-Leste, Tonga, Tuvalu, and Vanuatu.
[3] Emerging Asia comprises China, India, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam.

Indonesia, and Japan, was a counterweight. Export volumes declined, reflecting soft demand in China, the euro area, and Japan, which more than offset buoyancy in the United States. The maturing of cross-border supply chains is also weighing on Asia's export growth (Box 1.1). Investment was generally lackluster, especially in China, where the real estate sector slowed further. Consumption, which remained relatively robust except in Japan, was the primary growth driver across most of the region.

Asia's growth is forecast to remain steady in 2015, although the region will continue to outperform the rest of the world (Figure 1.2). In addition to country- and region-specific factors, this forecast reflects four concurrent global cross-winds: lower oil prices, asynchronous monetary policies and exchange rate divergence in major economies, shifting financial conditions, and the moderating pace of potential growth.

Figure 1.2
Asia: Contribution to World Real GDP Growth
(Purchasing power parity based; percent)



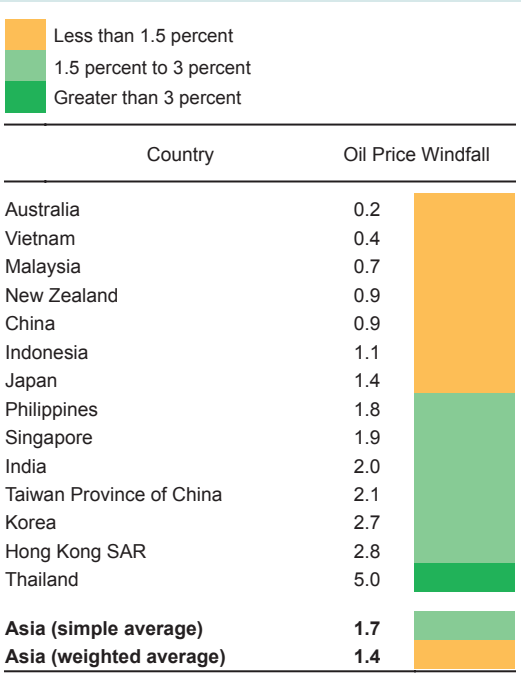
Sources: IMF, World Economic Outlook database; and IMF staff calculations.

While falling world oil prices will be a tailwind for growth in much of the region, it is balanced by somewhat more restrictive financial conditions—largely because of slower capital inflows or even reversals in anticipation of tightening by the Federal Reserve—compounded by sizable realignments of the major reserve currencies. As a result, the region is projected to grow by 5.6 percent in 2015, reflecting accelerations in member countries of the Association of Southeast Asian Nations (ASEAN), India, and Japan, which offset further moderation in China. Over the medium term, the region's growth is expected to stabilize around the current rate, in line with the moderation of potential growth since the global financial crisis.

Impact of Lower Oil Prices on Asia

Asia's growth is set to benefit from the decline in oil prices since the fourth quarter of 2014. While much of the initial decline in oil (and other commodity) prices has been due to weaker global demand, increased supply has played a more important role since late last year. Simulations suggest that the decline in oil prices could boost global GDP by 0.3 percentage point to 0.7 percentage point in 2015, depending on the assumed contribution of demand and supply factors to the price decline (Arezki and Blanchard 2014). However, the benefits are unevenly distributed, with substantial adverse impacts concentrated in a relatively small number of oil exporters while smaller gains accrue to a much wider group of oil importers. In Asia—a region mainly composed of oil importers—the windfall gain in real purchasing power from falling oil prices amounts to 1.7 percentage points of GDP on average in 2015. However, the region also includes large exporters of non-oil commodities, the prices of which have declined as well. Considerable heterogeneity in growth and current account impacts is therefore expected across the region, reflecting country-specific characteristics and considerations (Figure 1.3). From a counterfactual forecasting exercise covering the 14 largest Asia and Pacific economies to isolate only the commodity price impacts for 2015, the following results emerge:

Figure 1.3
Oil Price Windfall: Impact on the Oil Trade Balance in 2015
(Percent of GDP)



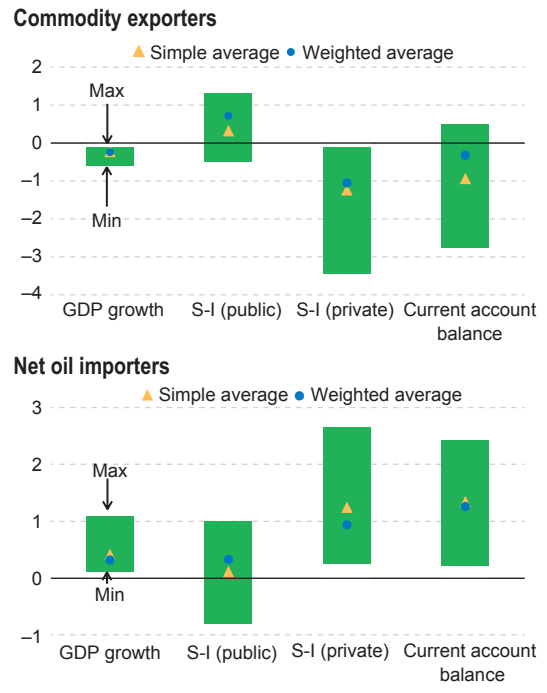
Country	Oil Price Windfall
Australia	0.2
Vietnam	0.4
Malaysia	0.7
New Zealand	0.9
China	0.9
Indonesia	1.1
Japan	1.4
Philippines	1.8
Singapore	1.9
India	2.0
Taiwan Province of China	2.1
Korea	2.7
Hong Kong SAR	2.8
Thailand	5.0
Asia (simple average)	**1.7**
Asia (weighted average)	**1.4**

Source: IMF staff estimates.
Note: Based on 2014 oil trade balance, assuming unchanged quantities and the April 2015 *World Economic Outlook* oil price projections for 2015.

- *Net oil (and commodity) importers*:[1] Benefits accrue to households and firms through higher real purchasing power. However, several factors tend to dampen the consumption increase: the small share of oil in the consumer basket (China and the Philippines), exchange rate depreciation (Japan), high saving propensity owing to cautious consumer sentiment (Korea), and incomplete pass-through to consumer prices (Thailand). Uncertainty about the duration of lower oil prices is also expected to reduce consumption propensity. In some countries, firms are the major beneficiaries of the oil price windfall, but related investment spending is limited by high corporate leverage (China)

[1] This group comprises China, Hong Kong SAR, India, Japan, Korea, Malaysia, the Philippines, Singapore, Thailand, Taiwan Province of China, and Vietnam.

Figure 1.4
Impact of Oil Price Decline on Macro Forecasts
(Percentage points of GDP; percent growth)



Source: IMF staff estimates.
Note: S-I = saving-investment. Deviation from October 2014 *World Economic Outlook* (WEO) as a result of the January 2015 WEO update's oil price baseline.

and expectations of low future growth given the slow pace of structural reforms (Japan). For most oil importers, fiscal balances are only marginally affected (consistent with findings in Chapter 1 in the April 2015 *Fiscal Monitor*), as somewhat higher tax revenue from increased activity is mostly offset by lower energy-based tax collections. For the group of net commodity importers as a whole, the oil price decline is expected to add 0.4 percentage point to growth and boost current accounts by 1.3 percent of GDP (Figure 1.4).

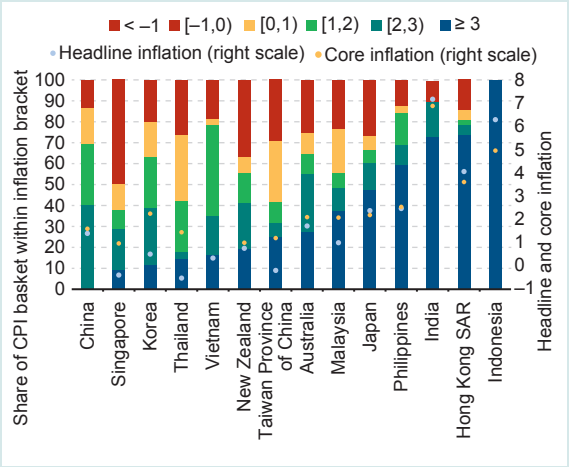
- *Net commodity exporters*: This group is more diverse. Although all are oil importers, they are large exporters of non-oil commodities whose prices have also declined: Malaysia (a natural gas exporter), Indonesia (an exporter of coal and natural gas), and Australia and New Zealand (exporters of nonenergy commodities). For this group, the average net windfall effect in 2015 from oil and other commodity price declines is a loss of 0.6 percent of GDP. In Indonesia and Malaysia, reduced spending on consumer fuel subsidies improves the fiscal position, while retail prices are largely unaffected.[2] In addition, the state-owned energy company bears the revenue loss from non-oil commodity exports in Malaysia, while in Indonesia, the public sector is adversely affected by forgone mining revenue at publicly owned mining companies and reduced royalties and taxes in the budget. In Australia and New Zealand, consumers gain from the oil price windfall while forgone mining receipts and royalties have a negative effect on mining companies and the fiscal accounts.

The WEO baseline oil price path—which foresees prices picking up gradually beginning in the second half of 2015 and stabilizing over the longer term at a lower level than before the price drop—is expected to cause widespread but temporary declines in headline inflation. As with growth, the effects will vary considerably across the region. This reflects differences in the pass-through of world prices to local prices, which depends, in turn, on the responsiveness of the local currency to the dollar—typically the numeraire currency for oil contracts—domestic energy pricing formulas, taxes and subsidies on energy products, and the weight of fuel in the consumer price index (CPI) basket. In the case of Japan, the effect on inflation is expected to be muted by the depreciation of the yen and the lump-sum nature of the tax on the retail price of gasoline. In China and India, the direct effect on CPI inflation is also expected to be relatively modest (less than ¼ percentage point) owing to the small share of oil in the consumption basket and the low domestic price pass-through to consumers. For the region as a whole, the decline in oil prices is expected to lower headline inflation by about 0.6 percentage point in 2015 (in addition to the 0.5 percentage point drop in 2014) (Box 1.2).

Despite the drop in headline inflation, core inflation is likely to be relatively insulated from the decline in

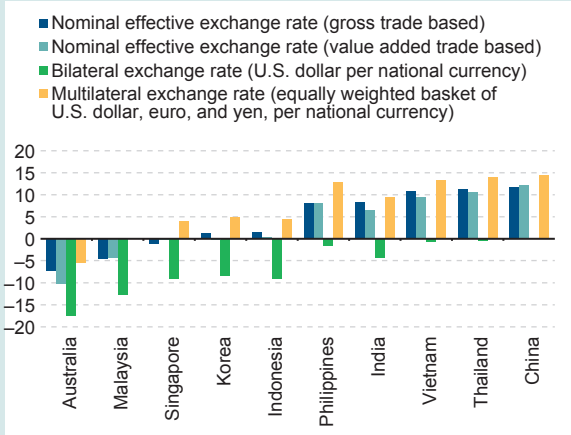
[2] However, following the subsequent reform of consumer fuel subsidies in Indonesia, the windfall gain from the oil price decline shifts from the government to the consumer.

Figure 1.5
Selected Asia: Inflation Decomposition of the CPI Basket



Sources: CEIC Data Co. Ltd.; Haver Analytics; and IMF staff calculations.
Note: CPI = consumer price index. The inflation diffusion index, headline inflation, and core inflation are based on the latest available data.

Figure 1.6
Selected Asia: Exchange Rates
(Percentage change since June 2014; positive = national currency appreciation)



Sources: CEIC Data Co. Ltd.; Haver Analytics; Organisation for Economic Co-operation and Development and World Trade Organization, Trade in Value Added database; and IMF staff calculations.

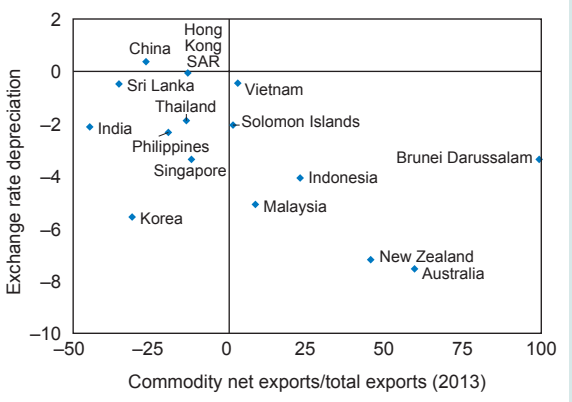
oil prices. This reflects the transient nature of part of the oil price decline, with prices forecast to begin to pick up later in the year, and broadly closed or small negative output gaps throughout much of the region, helping to underpin price increases in other items. Moreover, for numerous economies, inflation rates for a substantial share of the CPI basket are currently running in excess of 3 percent (50 percent or more of the basket in Hong Kong SAR, India, Indonesia, and the Philippines; Figure 1.5). In several countries (Indonesia, Japan, Malaysia), the large share of high-inflation items reflects past exchange rate depreciation, hikes in indirect taxes, or the elimination of consumer subsidies. In Korea, Singapore, and Thailand, by contrast, the share of low-inflation (1 percent or less) items is relatively large and predates the decline in world oil prices, suggesting that other causes, including sizable excess capacity, previous currency appreciation, or both, have also contributed to slower price momentum.

Sustained Realignment of Major Currencies

Asynchronous monetary policies in major advanced economies in response to divergent cyclical conditions have contributed to large and rapid exchange rate realignments. Robust growth and the prospect of higher interest rates in the United States, coupled with the start of quantitative easing in the euro area and further monetary stimulus in Japan, have caused the value of the major reserve currencies to diverge sharply. While the dollar has gained substantially against most other currencies, rising about 9½ percent on a trade-weighted basis since the end of June 2014, the yen has fallen by about 10½ percent in nominal effective terms over the same period, and the euro has been broadly unchanged.

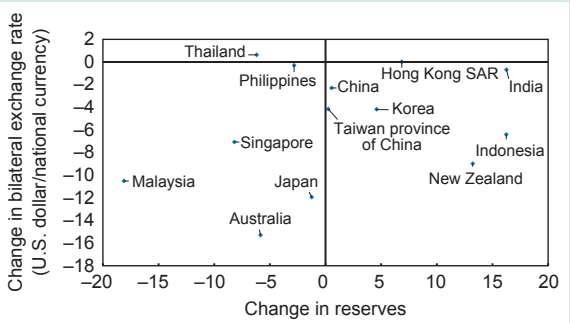
Against this backdrop, a number of Asia and Pacific currencies have appreciated in nominal effective terms since mid-2014. This reflects somewhat greater stability of Asian currencies relative to the dollar than implied by the share of the United States in these countries' gross trade (Figure 1.6). In contrast, the currencies of commodity-exporting Australia, Malaysia, and New Zealand have depreciated in nominal effective terms (Figure 1.7). Changes in real effective exchange rates have been broadly in line with changes in their nominal counterparts. However, using weights based on domestic value added in exports, appreciations of most Asian currencies have been less pronounced, suggesting a more modest erosion

Figure 1.7
Asia: Commodity Exports and Exchange Rate Movements
(Percent)



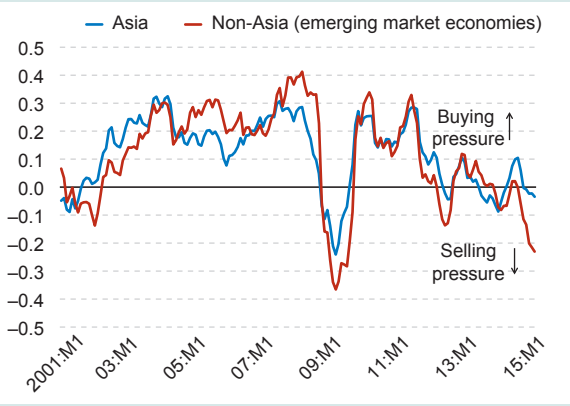
Sources: CEIC Data Co. Ltd.; IMF, *Direction of Trade Statistics*; UN Comtrade database; and IMF staff calculations.
Note: Commodity sectors are classified based on Standard International Trade Classification codes 0, 1, 2, 3, 4, 68, 667, and 971. Exchange rate depreciation is based on exchange rate changes between 2014:Q3–2014:Q4.

Figure 1.8
Selected Asia: Change in Exchange Rates and Reserves
(Change since end-2013; percent)



Sources: Bloomberg L.P.; CEIC Data Co. Ltd.; Haver Analytics; and IMF staff calculations.

Figure 1.9
Asia: Exchange Market Pressure Index
(Change in U.S. dollar/local currency exchange rate + change in reserves)



Source: IMF staff calculations.
Note: Asia includes Australia, China, Hong Kong SAR, India, Indonesia, Japan, Korea, Malaysia, New Zealand, the Philippines, Singapore, Taiwan Province of China, Thailand, and Vietnam.

of competitiveness (see also Chapter 3).[3] This result is compatible with still-sizable current account surpluses across much of the region, which may help explain why several countries have been willing to expend substantial reserves to support their exchange rates against selling pressure (Figures 1.8 and 1.9).

Large and rapid realignments of the major reserve currencies could create a dilemma for some Asian economies. The appreciation of the dollar has occurred following a decade or more of buildup of dollar-denominated debt in Asia, especially in the ASEAN-4 (Indonesia, Malaysia, Singapore, Thailand), China, India, and Korea. In several countries, firms have increased their reliance on foreign currency (mainly dollar) bond financing, potentially exposing them to exchange rate risk and higher hedging costs. For policymakers, this could create an uncomfortable near-term trade-off between competitiveness and financial stability. On one hand, maintaining external competitiveness requires limiting exchange rate movements against major trade partners and competitors. On the other, financial stability considerations would suggest letting the exchange rate move in tandem with the dollar. For individual economies, finding the appropriate balance could become more challenging if other economies in the region adjust their exchange rates, potentially triggering a cascade of exchange rate changes.

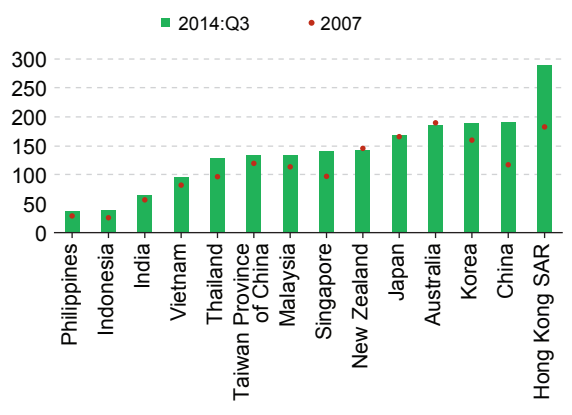
[3] Given the importance of cross-border supply chains in Asia, much of individual countries' exports represent foreign—rather than domestic—value added. Therefore, assessing competitiveness on gross-trade-weighted indicators can be misleading.

Shifting Financial Conditions in Asia

Since the global financial crisis, credit-to-GDP ratios have risen in many Asian economies, in some cases quite sharply. In some countries, this reflects the rapid increase in household borrowing (Korea, Malaysia, Thailand) and pockets of rising leverage in the corporate sector (India, Korea, Malaysia, Thailand). In China, households, firms, and local governments have increased their borrowing (Figure 1.10). This credit buildup reflects the combination of very accommodative monetary conditions in advanced economies and accompanying capital inflows to emerging markets, together with looser domestic monetary policies in response to slowing real activity. This additional credit—supplied through domestic banks and nonbank financial institutions, cross-border bank lending, and issuance of debt securities—has helped finance consumption, real estate activity, and equity prices, helping to buoy GDP growth through credit and wealth channels. In numerous countries, however, the stimulative effect of credit on output has eased in recent years (Box 1.3), suggestive of increased financial—rather than economic—risk taking.[4]

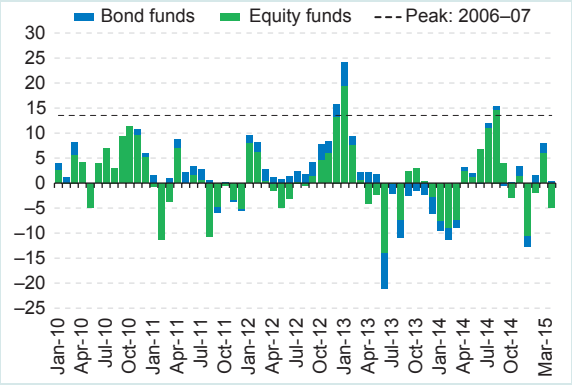
The rebalancing of global growth and the prospect of higher U.S. interest rates triggered a renewed reversal of capital flows from Asia in late 2014. Capital inflows into emerging Asia resumed following the "taper tantrum" of mid-2013 and the start of tapering by the Federal Reserve in January 2014, but at a more subdued pace than previously (Figure 1.11). However, by the fourth quarter of 2014, capital flows to the region reversed course again on negative GDP surprises in some Asian countries, weaker growth prospects in commodity exporters, and growing evidence of the firming U.S. recovery, which fueled expectations of a prospective increase in the federal funds rate.

Figure 1.10
Selected Asia: Credit by All Providers to the Nonfinancial Private Sector
(Percent of GDP)



Sources: Bank for International Settlements, Credit to the Private Sector database; CEIC Data Co. Ltd.; and IMF staff calculations.

Figure 1.11
Asia: Equity and Bond Funds—Monthly Net Flows
(Billions of U.S. dollars)

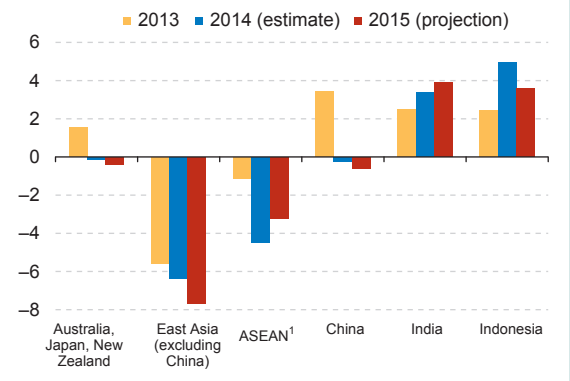


Source: Haver Analytics.
Note: Includes exchange traded fund flows and mutual fund flows for emerging Asia, Australia, Hong Kong SAR, Korea, New Zealand, Singapore, and Taiwan Province of China.

While China accounted for the bulk of the portfolio outflows from emerging Asia, outflows were also sizable from Malaysia and Thailand. In contrast, financial inflows recently resumed in some countries in response to stronger reform agendas or strong GDP growth (Indonesia, the Philippines; Figure 1.12), while in others (China, Korea), balance of payments inflows reflected

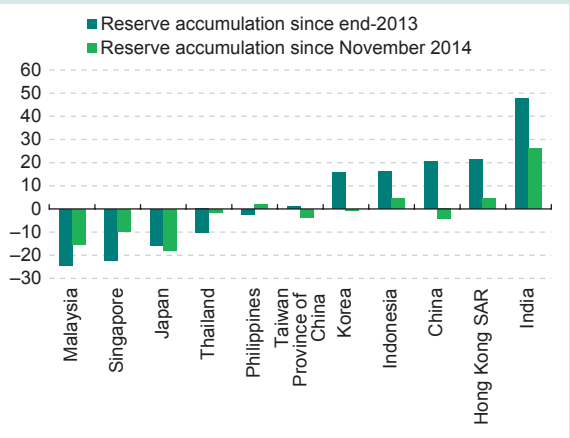
[4] The disconnect between financial and economic risk taking is evident in the rapid increase in equity valuations in Asia (as elsewhere), while investment-to-GDP ratios remain subdued (see Chapter 4 in the April 2015 *World Economic Outlook* and Chapter 1 in the October 2014 *Global Financial Stability Report*).

Figure 1.12
Asia: Financial Account Balances
(Percent of GDP)



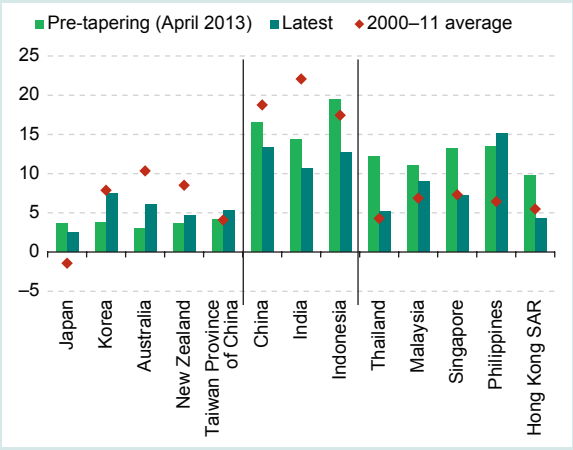
Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Inflows are included with a positive sign, while outflows are included with a negative sign. Financial account balance excludes reserve assets. Financial account balances are based on definitions from the IMF's *Balance of Payments Manual* (IMF 2009).
[1] ASEAN includes Malaysia, the Philippines, Singapore, Thailand, and Vietnam.

Figure 1.13
Selected Asia: Foreign Exchange Reserve Accumulation
(Billions of U.S. dollars)



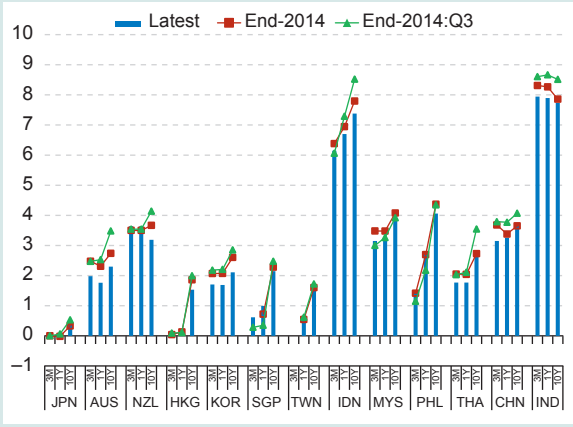
Sources: CEIC Data Co. Ltd.; Haver Analytics; and IMF staff calculations.

Figure 1.14
Selected Asia: Private Sector Credit Growth
(Year-over-year; percent)



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

Figure 1.15
Asia: Sovereign Bond Yields
(Percent per annum)

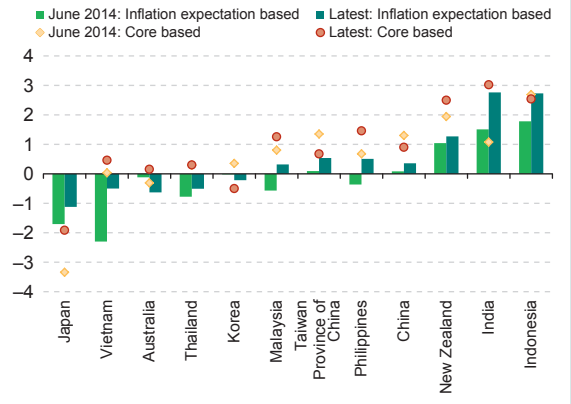


Sources: Bloomberg L.P.; and CEIC Data Co. Ltd.
Note: 3M = three-month treasury bills; 1Y = one-year government bond yield; 10Y = 10-year government bond yield. When exact maturity is not available, the next closest maturity is used. Country codes are based on International Organization for Standardization classifications.

current account surpluses. In India, capital inflows were robust throughout 2014, reflecting lower vulnerabilities and improved investor sentiment. Several countries increased their reserve positions in 2014 as a result (China, India, Indonesia, Korea; Figure 1.13).

Financial conditions have started to tighten in a number of Asian economies. Bank loan growth remains relatively buoyant (albeit trending downward in major economies) and long-term government bond yields have eased (Figures 1.14 and 1.15). However, funding conditions have generally tightened, reflecting rising loan-to-deposit ratios, slowing corporate debt issuance since late 2014 (especially in emerging Asia), and decelerating foreign bank claims on emerging Asia. Moreover, declining headline inflation

Figure 1.16
Selected Asia: Real Policy Rates
(Percent)



Sources: CEIC Data Co. Ltd.; Consensus Economics; Haver Analytics; and IMF staff calculations.
Note: Real policy rate is based on one-year-ahead inflation forecast from Consensus Economics. For Japan, the uncollateralized overnight rate is used. For India, the three-month treasury bill rate is used as the proxy for policy rate.

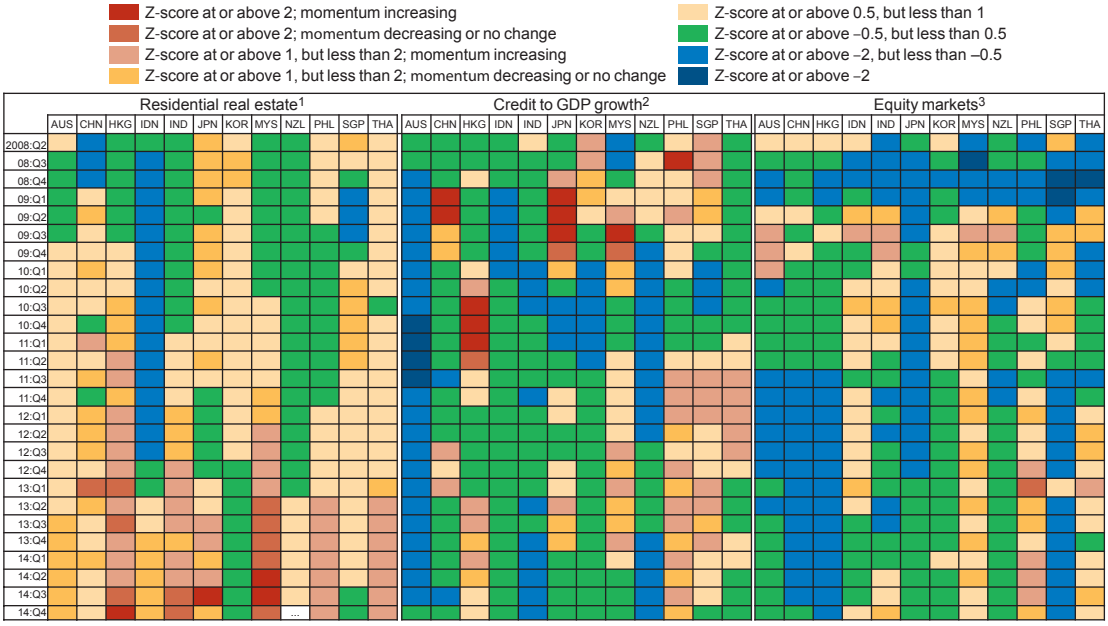
has led to some increase in real interest rates (Figure 1.16). In several countries, declines in the prices of commodities, properties, and outputs of overinvested industries also tend to elevate real debt burdens in those sectors because an increasing share of declining revenue is required to meet debt-service obligations. Financial conditions indices estimated for several Asian economies suggest that, except in the cases of Japan and Korea, financial conditions have begun to tighten across the region, although from a very accommodative starting point (Box 1.4). This tightening has occurred even though domestic monetary policies have been unchanged or have even been loosened in several countries and remain in line with estimated Taylor rules, pointing to the importance of the global financial cycle in domestic conditions in Asia. Conditions could tighten further when the Federal Reserve commences raising its policy rate. Simulations suggest this would be accompanied by increased volatility and corporate spreads, causing rising term premiums and borrowing costs, as well as exchange rate depreciations in Asian emerging markets (Box 1.5). These conditions could create difficulties for marginal borrowers attempting to roll over debt and have an impact on investment, with adverse effects on potential growth. Countries where foreign ownership of public and private sector bonds is elevated and where the domestic investor base is relatively shallow (Indonesia, the Philippines) could be more susceptible, although prudent macroeconomic positions and policy buffers provide some countervailing protection.

Based on standard indicators, and despite substantial positive credit gaps in several economies, financial sector risks across Asia have been contained, underpinned by sustained income growth and supportive financial conditions (Figure 1.17). While generally subdued overall, risks are most evident in the real estate sector, in which price-to-rent and price-to-income ratios are elevated across much of the region and have risen further in several economies (Hong Kong SAR, India). In Japan, the recent rapid run up in prices occurred following two decades of subdued real price behavior. On the other hand, bank-credit-to-GDP ratios have recently risen more slowly in most of the region's economies, with the Philippines an exception owing to a very rapid increase in bank lending. However, previous rapid credit growth has pushed credit-to-GDP ratios above trend, resulting in substantial positive credit gaps in Australia and the Philippines (Figure 1.18). Equity market indicators generally appear comfortable, with strong earnings supporting price growth, except in India. Nonetheless, these standard indicators are largely backward looking, and a downturn in growth prospects or a sharp tightening of financial conditions could present a future risk, particularly where debt levels have risen rapidly.

With the corporate sector having amassed considerable debt in recent years, Asia's risks have risen but generally appear manageable (Figure 1.19). Across the region, the evolution of debt-to-equity ratios is mixed, with declines in several ASEAN countries and increases in Australia and India (Figure 1.20). In addition, leverage ratios in unlisted companies tend to be higher than those in listed (and typically larger) firms. Overall, however, there is little evidence of excess leverage at the aggregate level. However, pockets of high

Figure 1.17

Asia Financial Stability Heat Map

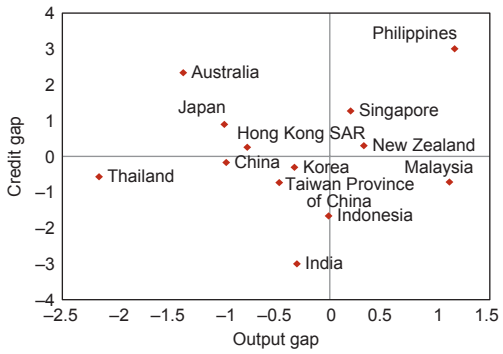


Source: IMF staff estimates.
Note: Colors represent the extent of the deviation from the long-term median expressed in number of median-based standard deviations (median-based Z-scores). Medians and standard deviations are for the period starting 2000:Q1, where data is available. Country labels use International Organization for Standardization country codes.
[1] Estimated using house-price-to-rent and price-to-income ratios.
[2] Year-over-year growth of credit-to-GDP ratio.
[3] Estimated using price-to-earnings and price-to-book ratios.

Figure 1.18

Asia: Output Gap versus Credit Gap

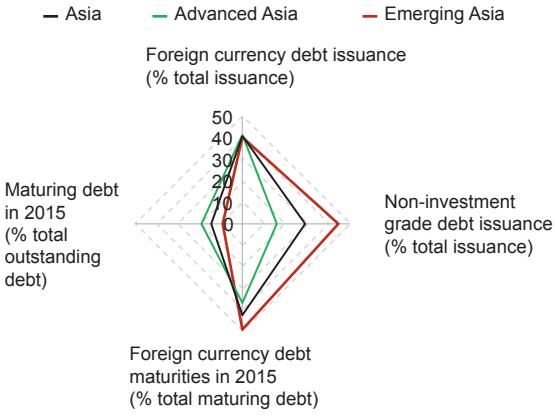
(Percent)



Sources: CEIC Data Co. Ltd.; IMF, World Economic Outlook database; and IMF staff calculations.
Note: Credit-to-GDP data are as of 2014:Q4. Credit gap is calculated as a percent deviation from the trend credit-to-GDP (approximated using the Hodrick–Prescott filter over the period 2000–14). The output gap is based on country estimates for 2015.

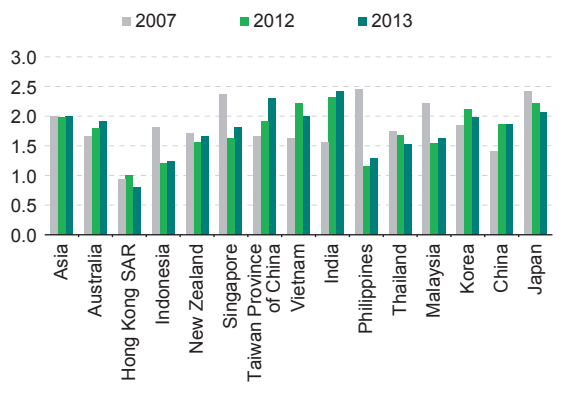
Figure 1.19

Asia: Nonfinancial Corporate Sector Potential Vulnerabilities, 2014



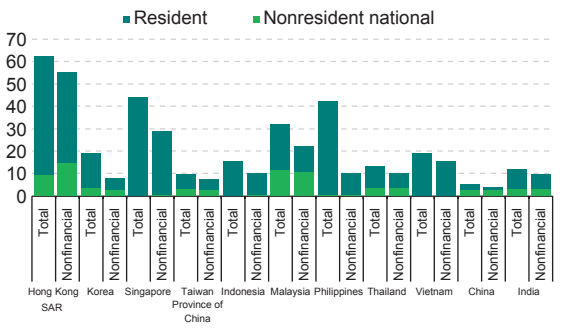
Source: Dealogic.
Note: Based on data related to issuance and maturing debt (i.e., bonds and syndicated loans). Data compiled on residency basis.

Figure 1.20
Selected Asia: Debt-to-Equity Ratio for All Firms (both listed and unlisted firms)
(Debt-weighted average)



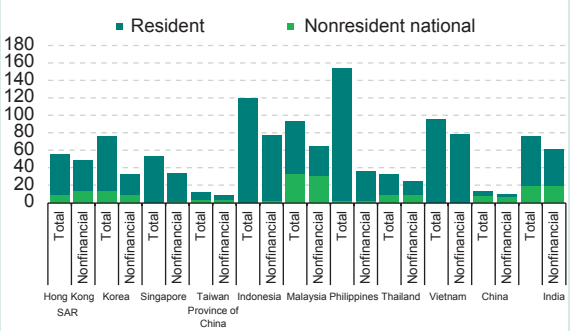
Sources: Bureau van Dijk, Orbis database; and IMF staff calculations.

Figure 1.21
Stock of Outstanding Bonds and Syndicated Loans in Foreign Currency—End-2014
(Percent of GDP)



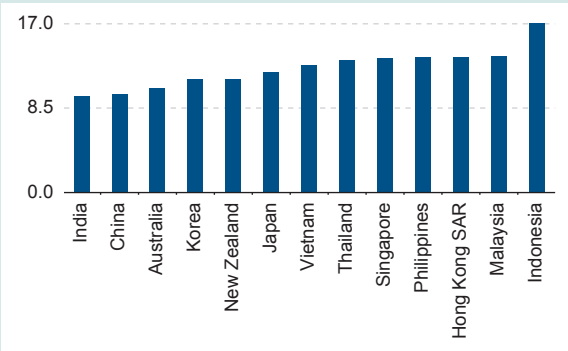
Sources: Dealogic; and IMF staff calculations.
Note: Residency basis measures borrowing by firms in the country of registration; nationality basis includes also offshore borrowing by nonresident affiliates of resident firms.

Figure 1.22
Stock of Outstanding Bonds and Syndicated Loans in Foreign Currency—End-2014
(Percent of reserves)



Sources: Dealogic; and IMF staff calculations.
Note: Residency basis measures borrowing by firms in the country of registration; nationality basis includes offshore borrowing by nonresident affiliates of resident firms.

Figure 1.23
Selected Asia: Tier 1 Capital Ratio—Latest
(Percent)



Sources: Country authorities; and IMF, Financial Soundness Indicators.
Note: As of 2014:Q3 or latest available: Australia: 2014:Q2; China: 2013; Hong Kong SAR: 2014:Q3; India: 2014:Q3; Indonesia: 2014:Q2; Japan: 2014:Q1; Korea: 2013:Q4; Malaysia: 2014:Q3; Philippines: 2014:Q3; Singapore: 2014:Q3; Vietnam: 2012; Thailand: 2014:Q3; New Zealand: 2014:Q2.

leverage may exist, which could have implications for systemic financial stability in the event of tail risks. Moreover, many firms have taken on foreign-currency-denominated debt, and while stocks are generally less than 20 percent of GDP in most economies, stocks-to-GDP ratios are considerably higher in some (Hong Kong SAR, Malaysia, the Philippines, Singapore; Figure 1.21). The pattern of foreign currency debt exposure looks somewhat different when such debt is measured against official reserves and where more countries appear exposed (Figure 1.22).

Bank balance sheets have strengthened across most of Asia. Bank profitability has been high in many countries and, together with injections of new Basel III–compliant equity, has contributed to an increase in Tier 1 capital (Figure 1.23). Loss-absorbing buffers (based on excess Tier 1 capital

and loan-loss reserves) are also sizable in Indonesia and the Philippines. However, liquidity indicators have weakened, with the ratio of liquid assets to liquid liabilities moderating and loan-to-deposit ratios (which are particularly high in Australia, Korea, and New Zealand) rising steadily in a number of economies, especially in ASEAN. The nonperforming loan ratio has been stable, ranging from ½ percent in Hong Kong SAR to about 4 percent in India.

Moderating Pace of Potential Growth Globally and in Asia

Potential growth across advanced and emerging market economies has declined in recent years. According to Chapter 3 in the April 2015 WEO, the decline in potential growth in advanced economies started in the early 2000s and was worsened by the global financial crisis, while in emerging markets, the decline began only after the crisis. In advanced economies, the slowdown occurred following exceptional growth in total factor productivity (TFP) associated with the information technology revolution and was compounded by the reduction in investment that slowed capital growth after global crisis, as well as by population aging. In emerging markets, the decline in potential growth was steeper and attributed to weaker TFP growth following the previous period of structural transformation. Potential growth in advanced economies is expected to rise but remain below precrisis rates in the medium term owing to aging and scars from the global financial crisis on capital stock growth. In emerging market economies, potential growth is expected to decline further amid aging, weaker investment, and lower TFP growth as these economies move closer to the technology frontier.

Knowing the level and growth rate of potential output is essential for determining an economy's cyclical position and for assessing the sustainability of public and private debt. Since the global financial crisis, growth across much of the world has repeatedly fallen short of forecasts, suggesting that this financial crisis was different from past crises in that it was associated not only with a reduction in the level of potential output, but also with its growth rate. A better understanding of the dynamics of potential growth and its components—labor, capital accumulation, and TFP—can help prevent errors in calibrating countercyclical policies and avoid the use of overly optimistic growth forecasts for evaluating debt sustainability.

Mirroring developments in actual growth, potential growth has slowed across much of Asia and Pacific. Analysis in Chapter 3 in the April 2015 WEO, which includes the five largest Asia and Pacific economies, finds that potential growth has declined quite sharply in Australia, China, India, and Korea in the five years since the global financial crisis, compared with before the crisis. This largely reflects decelerating TFP (accounting for nearly three-fourths of the moderation in potential growth), although slower growth in labor's contribution because of aging has been the main culprit in Australia and Korea.[5] On the other hand, potential growth is found to have risen in Japan on accelerating TFP, which has more than offset shrinking potential employment. The slowing of TFP growth across much of the region may reflect a slowing of gains from participating in global value chains and the reduced efficiency of credit allocation (as suggested by the increase in the credit intensity of output), which are weighing on the pace of productivity growth.

Potential growth could decline further in several Asian countries. Against average rates immediately following the global financial crisis, potential growth in Australia, China, and Korea is predicted to moderate further, but it is expected to stabilize in India and Japan. The drop in China could be pronounced if the impact of workforce aging and the expected decline in the investment ratio as the economy continues to rebalance are not accompanied by faster TFP growth from improved

[5] This is broadly consistent with estimates in the April 2013 *Regional Economic Outlook: Asia and Pacific*, which concludes that TFP is the primary factor behind the deceleration in growth in China and India, although not in the ASEAN-5 or Korea.

resource allocation efficiency. These estimates for potential growth are broadly in line with medium-term growth forecasts. For Asia and Pacific as a whole, growth is expected to average 5.6 percent during 2016–20 (6 percent in Asia excluding China and Japan), about 2 percentage points lower than the pace recorded in the three years preceding the global financial crisis. Growth in India, which is expected to remain the fastest-growing large economy in the world over the medium term, is projected to stabilize at 7¾ percent, but even that would be about 1.7 percentage points lower than before the global financial crisis.

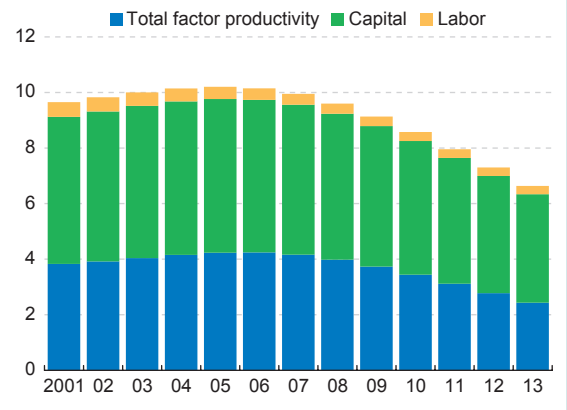
Is China Slowing to a More Sustainable Pace?

Following three decades of remarkable growth, China's economy is slowing as rebalancing continues. This slowing is partly structural, reflecting income convergence and waning dividends from past reforms. In addition, to avert a sharp growth decline as external demand collapsed in the wake of the global financial crisis, policies were implemented to encourage credit-intensive investment. This fueled a boom in housing construction and lifted debt-to-GDP ratios from 100 percent of GDP in 2007 to more than 200 percent in 2014, with less well-regulated shadow banks providing two-thirds of the increase. This strategy created vulnerabilities, as rapidly growing stocks of unsold housing and related raw materials and intermediate products indicate (see Box 1.6), and coincided with a steady decline in TFP growth caused by inefficient allocation of investment (Figure 1.24). As a result, potential growth has declined even though China remains a middle-income country on a per capita basis, while vulnerabilities in the real estate and credit sectors have risen.

China's Recent Macroeconomic Developments

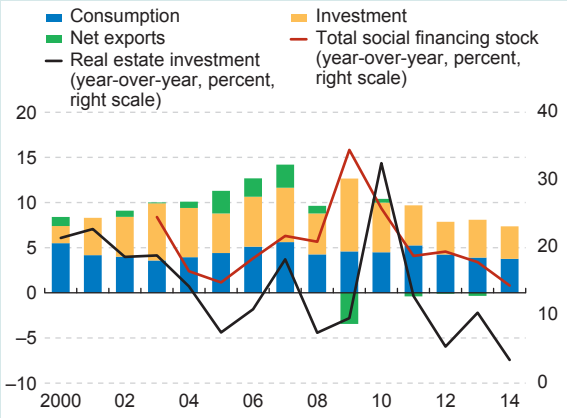
The continuing growth slowdown in China has occurred against an ongoing correction in the housing sector and rising concerns about the high level of indebtedness. Economic activity decelerated to 7.4 percent in 2014, down from 7.8 percent in 2013, but reached only an annualized 6 percent in the fourth quarter (Figure 1.25). The slowdown mainly reflected a sharp reduction in residential investment amid declining house prices across the 70 largest cities, which exceeded 5 percent in early 2015 (Box 1.6). However, infrastructure spending by local governments supported growth. Private consumption held up relatively well on tight labor market conditions and strong real wage growth.

Figure 1.24
China: Potential Growth Decomposition
(Percentage points)



Source: IMF staff calculations.

Figure 1.25
China: Growth Slowing Down
(Percentage points unless otherwise specified)

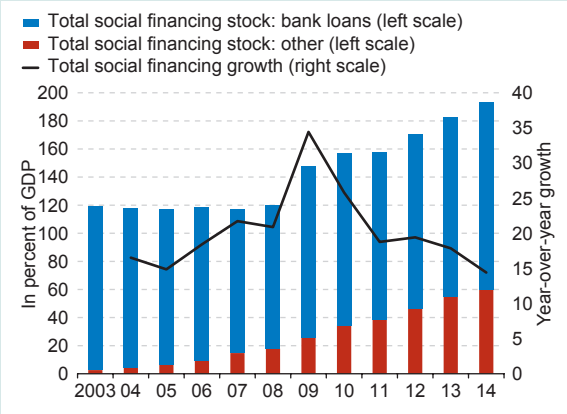


Sources: CEIC Data Co. Ltd.; and IMF staff calculations.

Weaker activity and the slide in world commodity prices caused China's inflation to moderate further and the current account surplus to increase. Headline inflation declined to 2 percent in 2014 on falling oil prices and the negative output gap. Food prices also declined, on favorable supply shocks and other idiosyncratic factors. So far, fuel prices have only had a relatively modest impact on overall inflation, given their small weight in the consumption basket in China and that several related prices are administered (such as transportation and utilities). However, inflation at the producer level, which has been negative for three years because of excess capacity and growing unsold inventories, has declined further since late 2014 on strong appreciation of the renminbi in effective terms and falling oil and other commodity prices. Commodity price declines also caused a large drop in nominal import growth to 0.7 percent in 2014 (from 7.3 percent in the previous year), marginally raising the current account surplus to 2 percent of GDP in 2014.

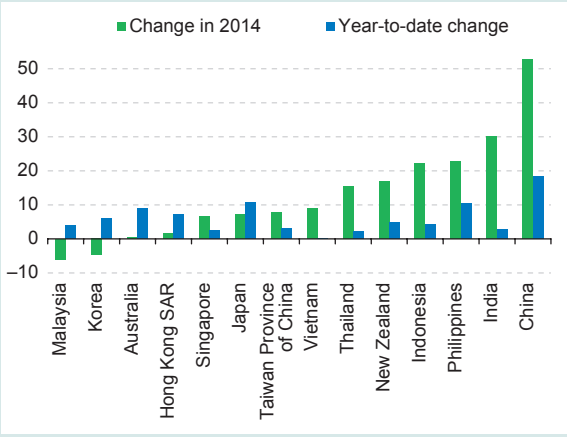
A tightening of financial conditions has occurred alongside the growth slowdown, reflecting capital outflows and policies to slow shadow banking, despite several rounds of monetary policy easing. Slowing growth and lower exchange-rate-adjusted interest differentials led to non–foreign direct investment (FDI) capital outflows of about $100 billion in 2014. While representing only 0.9 percent of GDP, and much smaller than the current account surplus, the capital reversal stands in contrast to the large inflows of earlier years. Nonetheless, the renminbi remains closely anchored to the dollar, leading to an 8 percentage point real effective appreciation, with a much larger appreciation against the euro and the yen. Growth in total social financing (the sum of bank and nonbank credit) cooled from a peak 25 percent in April 2013 to 16 percent in December 2014 (Figure 1.26). This coincided with several initiatives to strengthen regulation and supervision of shadow banking, although part of the funding appears to have been diverted to the equity market, where prices rose by more than 50 percent in 2014, with further large increases so far in 2015 (Figure 1.27).

Figure 1.26
China: Social Financing Stock
(Percent)



Source: Haver Analytics.

Figure 1.27
Asia: Stock Markets
(Change of stock market index; percent)



Sources: Bloomberg, L.P.; and IMF staff calculations.

Domestic and offshore bond issuance by private companies (mostly linked to real estate) has also dropped off sharply. Market interest rates (in real terms) have been on an upward trend since the summer of 2014, even though the People's Bank of China cut benchmark deposit and lending rates in November 2014 and February 2015, and lowered reserve requirements in January 2015. Despite these policy actions, overall financial conditions have been on a tightening trend.

China's Outlook and Policy Requirements

While still outperforming most other large economies, China's growth rate is expected to continue to edge lower over the medium term as rebalancing proceeds. Growth is projected to ease to 6.8 percent in 2015 and to 6.3 percent in 2016 as the correction in the residential and related sectors continues to drag on investment. With activity projected to continue to shift toward the more labor-intensive services sector, consumption growth is likely to remain stable, supported by further job creation. Inflation is forecast to remain low at 1.2 percent year over year, reflecting subdued growth, the drop in world commodity prices, and the appreciation of the renminbi. The current account surplus is expected to rise to 3.2 percent of GDP on the full-year effect of lower commodity prices, despite weaker real import demand and the stronger currency. Under full implementation of the government's reform blueprint, which is intended to reorient the underlying drivers of the economy, growth is expected to moderate to 6 percent by 2017 and stabilize at about that rate thereafter, with the decline in investment and employment partly cushioned by faster TFP growth.

The challenge for China is to find new, sustainable engines of growth while managing vulnerabilities generated under previous policies. This would allow a more balanced convergence path toward high-income status that results in a substantially higher private consumption share and gradual deleveraging by the private and local-government sectors. Given China's now dominant role as contributor to global growth, its securing a stable growth path—even if slower than in prior decades—is essential for the rest of the world. While this is likely to entail some cost to near-term growth for countries linked to China through regional supply chains (see the April 2014 *Regional Economic Outlook: Asia and Pacific*, Box 1.3), allowing the market to play a decisive role in resource allocation can be expected to yield higher incomes for China, Asia as a whole, and the rest of the world in the longer term.

To help deliver durable and balanced growth, China needs reforms that reorient the economy away from excessive reliance on real estate, heavy industry, and external demand. Implementing the Third Plenum reform blueprint of 2013 without delay is critical to sustainable growth:

- *Orderly deleveraging*. Facilitating corporate deleveraging, including through legal frameworks for orderly debt restructuring and the transparent recognition of costs of nonviable firms, would help better manage corporate sector vulnerabilities and contain the macroeconomic headwinds from unwinding debt.
- *Financial rebalancing*. Efforts to curtail the riskiest parts of credit activity, especially in shadow banking, should continue. Further liberalizing interest rates for savers will improve the efficiency of credit allocation and reduce incentives to save in the form of real estate and nonbank instruments that have fed the largely unregulated shadow banking segment. Avoiding perceptions of implicit guarantees would reduce moral hazard, promote more rigorous credit underwriting, and help create a more robust financial sector.
- *Fiscal reforms*. The budget law that came into effect at the start of 2015 is welcome and aims to strengthen fiscal management, transparency, and local-government financial discipline. Better aligning local-government expenditure responsibilities with recurrent revenue is also a priority.
- *State-owned enterprise and other reforms*. Further reforms to the sector, particularly removing implicit guarantees and improving corporate governance, will help level the playing field for firms and increase the efficiency of credit and resource allocation. Liberalizing the registration system (*hukuo*) in large cities to include internal migrant households and help reduce the dual labor market is also important.

Policies will need to be calibrated to prevent an excessively rapid slowdown. The priority is to make further progress in containing vulnerabilities while securing a gradual moderation of growth.

Slowing too rapidly risks triggering a disorderly adjustment that could spiral into a negative feedback loop between falling activity, investment and employment, and rising nonperforming loans. But delaying adjustment would lead to further debt buildup, increasing the risk of a sharp correction in the medium term or protracted slow growth. To deliver the desired slowdown, fiscal stimulus should be the first line of defense, with an emphasis on measures to support private consumption. Monetary policy should continue to focus on price stability, and any further monetary easing should be data dependent. Exchange rate policy should continue to allow greater flexibility by reducing foreign exchange intervention.

Will Japan's Recovery Gather Steam?

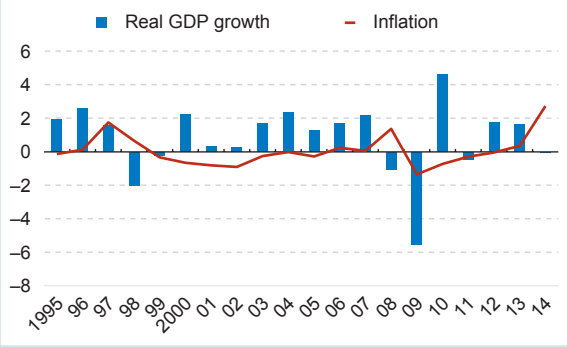
"Abenomics" has jump-started Japan's inflation and GDP growth, but a durable escape from low growth and deflation is not yet assured. A shrinking and aging workforce and substantial labor and product market rigidities have mired the economy in stagnation and deflation for about two and a half decades. Large fiscal and monetary stimuli in this period have been only partially successful, yet have contributed to a high public debt ratio (around 250 percent of GDP). Despite low real interest rates and a mostly competitive real effective exchange rate, private investment remains dampened by weak growth prospects and falling prices. Many Japanese corporations remain highly profitable but have opted to shift production capacity abroad. To help break the ensuing vicious cycle of low private spending and falling wages and prices, Prime Minister Shinzo Abe in December 2012 announced an ambitious coordinated package of reforms comprising three "arrows"—an aggressive easing of monetary policy, called qualitative and quantitative easing; flexible fiscal policy; and a series of structural policies to raise potential growth. However, implementation so far has tilted mainly toward monetary easing—with qualitative and quantitative easing further expanded in October 2014—and fiscal adjustment.

Japan's Recent Macroeconomic Developments

Following a choppy and disappointing performance for much of the year, growth recovered in late 2014, buoyed by rebounding exports. After a surge in domestic demand in the first quarter ahead of an increase in the consumption tax rate from 5 to 8 percent, consumption plummeted in the second quarter and remained weak in the third, putting the economy in a technical recession. However, growth resumed in the fourth quarter on a rebound in exports, aided partly by the large yen depreciation that had previously boosted exporters' profit margins (Box 1.7), together with a modest revival in consumption. However, investment remained subdued. Overall, activity declined by 0.1 percent for the year, and a durable increase in aggregate demand is not yet evident (Figure 1.28). Nonetheless, there is little evidence of slack in the economy: unemployment is low at 3.5 percent, and other indicators also suggest the output gap is small.

Support to inflation from the Bank of Japan's aggressive balance sheet expansion is being countered by falling oil prices, the continued prospect of weak growth, and entrenched deflation dynamics. Inflation peaked at 3.7 percent in May 2014 on the back of the cumulative 30 percent effective yen depreciation since September 2012 and the hike in the consumption

Figure 1.28
Japan: Real GDP Growth and Inflation
(Year-over-year percent change)



Source: IMF, World Economic Outlook database.

tax in March 2014. Price increases were widespread across the consumption basket, with prices rising nearly 3 percent or more year over year in nearly half of the basket, compared with less than 10 percent of the basket before the yen started to depreciate. Medium-term inflation expectations have also risen, as gauged by interest differentials on five-year indexed and nonindexed bonds. Since mid-2014, however, headline inflation (though excluding the effects of the consumption tax increase) has begun to abate, and it reached only 0.3 percent in January 2015, well below the Bank of Japan's 2 percent target. Excluding energy and food prices, "core-core" inflation has also weakened, from just below 1 percent in early 2014 to about 0.4 percent in January 2015. While nominal wages rose by 0.6 percent in 2014, this mainly reflects one-off bonuses rather than higher base wages. Apartment prices in Tokyo have risen by 20 percent since the end of 2012, possibly reflecting some shift by the private sector into real estate and real estate investment trusts to replace the Japanese government bonds sold to the Bank of Japan as part of its asset purchase program. Equity prices have also continued to climb, with the major benchmark index up 26 percent over the past year.

Japan's Outlook and Policy Requirements

Economic activity is forecast to recover modestly under current policies. Growth is expected to pick up to about 1 percent in 2015 and 1.2 percent in 2016, marginally faster than potential, underpinned by recovery of private consumption and strengthening exports. Private consumption is expected to pick up owing to increased purchasing power from lower oil prices, government cash transfers to low-income households, and rising real wages on faster nominal wage growth. Despite the rebound in export volumes, private investment is projected to remain soft as expectations of future demand remain subdued and uncertainty remains substantial, including about the future course of structural reforms. The current account surplus is expected to widen substantially to 1.9 percent of GDP on dynamic exports, the decline in commodity prices, and subdued investment.

Mustering an aggressive and encompassing policy response will be critical to achieving "escape velocity" for the Japanese economy. With nominal interest rates constrained by the zero lower bound, sustained low inflation likely pushes real interest rates above the real neutral rate consistent with Japan's low potential growth rate. Therefore, a strategy to break the low inflation–low growth cycle is critical, including a renewed focus on reforms and well-targeted demand policies. Several elements are already in place, most notably qualitative and quantitative easing, while a medium-term fiscal consolidation plan is not in place, and ambitious structural reforms are still pending:

- Further enhancements to the Bank of Japan's monetary stimulus may be warranted, particularly to the "qualitative" part of monetary easing, if necessary to achieve the 2 percent price stability target. First, the Bank of Japan could lengthen the maturity of the Japanese government bonds it purchases (thereby further lowering longer-term interest rates) and expand the range of private sector assets it purchases by encouraging securitization. Second, the Bank of Japan could also enhance its forward guidance by committing to maintaining the size of its balance sheet even after exiting qualitative and quantitative easing, which would prevent withdrawal of monetary accommodation until inflation expectations are firmly cemented at the central bank's inflation objective. The central bank could consider accelerating qualitative and quantitative easing if the drop in oil prices affects core inflation or longer-term inflation expectations.
- The fiscal strategy should balance support for near-term growth with reducing medium-term fiscal risks. The decision to postpone the second increase in the consumption tax, from 8 to 10 percent, from October 2015 to April 2017 was appropriate in view of the

uncertain growth outlook. Bank of Japan purchases of Japanese government bonds will, as a by-product of qualitative and quantitative easing, help contain government interest costs. Nonetheless, a credible and concrete medium-term fiscal consolidation strategy that specifies structural measures to place debt on a declining path is needed. Such a plan would maintain market confidence and help policymakers respond flexibly if downside risks materialize.

- Full implementation of ambitious productivity-enhancing reforms is critical to boost growth and help debt sustainability. Measures to raise labor supply, especially by increasing employment of women and older and foreign workers, would raise trend growth and reverse the decline in the labor force that is pulling down potential growth (Box 1.8). Reducing labor market duality would also encourage greater pass-through of higher inflation expectations into base wages. Corporate governance reforms and deregulation in the services sector would help boost domestic investment by lifting growth expectations.

India: A Bright Spot in the Global Economy

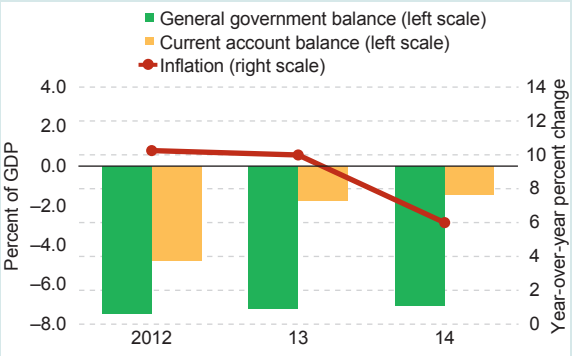
Following several years of robust growth in the lead up to and immediately after the global financial crisis, India's growth slowed sharply during 2011–13. This reflected the combined effects of political uncertainty prior to the 2014 national elections, a less than fully effective macroeconomic policy framework, and increasingly binding supply-side impediments to activity that led to a generalized slump in investment. Despite the weakening domestic demand, large domestic and external imbalances emerged on rising food prices and gold imports, rendering the economy sensitive to external financial shocks. As a result, the economy was hit hard by the mid-2013 taper tantrum, which led to large capital outflows and left the rupee considerably weaker. Since then, however, the Indian economy has made a remarkable turnaround in response to more effective policies and resolution of political uncertainty. Domestic and external vulnerabilities have moderated on the sharp decline in the current account deficit and inflation, the fiscal position has begun to improve, and a resumption of capital inflows allowed a significant buildup in foreign reserves. This confluence of achievements has made India one of the bright spots in the global economy. Nonetheless, downside risks remain, including from potential surges in global financial market volatility and slower global growth, as well as policy implementation risks within India.

India's Recent Macroeconomic Developments

The Indian economy has made a remarkable turnaround since mid-2013. After bottoming at 5.1 percent in 2012, growth rose steadily, reaching an estimated 7.2 percent in 2014.[6] At the same time, CPI inflation declined from 10 percent during 2012–13 to about 5¼ percent in March 2015, reflecting the tight monetary policy stance, lower global commodity prices, remaining economic slack, as well as government efforts to contain food inflation, which afforded the Reserve Bank of India (RBI) space to lower its policy rate by 50 basis points in early 2015 (Figure 1.29). External vulnerabilities have subsided on the reduction in the current account deficit from 4¾ percent of GDP in 2012 to below 1½ percent in 2014, robust capital inflows, and an accompanying buildup in reserves. The 2014/15 budget deficit target of 4.1 percent of GDP (authorities' definition, equivalent to 4.5 percent on the IMF's definition) was likely met, helped by the decline in global oil prices and recent deregulation of domestic fuel prices. As a result,

[6] India's Ministry of Statistics released, on January 30, 2015, a new series for the national accounts, revising the base year and incorporating numerous conceptual and methodological changes. The revised data spans fiscal year (FY; April–March) 2011/12 through FY2014/15. As a result, GDP growth was revised up by 0.4 percentage point and 1.9 percentage points for FY2013/14 and FY2014/15, respectively.

Figure 1.29
India: Current Account, Fiscal Balance, and Inflation



Sources: Haver Analytics; India Ministry of Finance; and Reserve Bank of India.

India is now better placed to deal with external financial shocks. Nonetheless, challenges remain as growth continues to be constrained by supply-side bottlenecks; previous weak growth and delays in implementing infrastructure projects have placed pressure on banks' asset quality (particularly at state-owned banks that lent heavily to infrastructure companies); and corporate vulnerability indicators, while showing signs of stabilization, remain elevated.

Important economic reforms have been initiated following the decisive outcome of the 2014 national elections. Following its landslide victory in May 2014, the new government of Prime Minister Narendra Modi introduced numerous economic reforms, including deregulating diesel prices and raising natural gas prices, moving to create more flexible labor markets and introduce a goods and services tax, enhancing financial inclusion, and relaxing FDI limits in several key sectors. The RBI has adopted a flexible inflation-targeting framework. These actions have also served to buoy investor sentiment.

India's Outlook and Policy Requirements

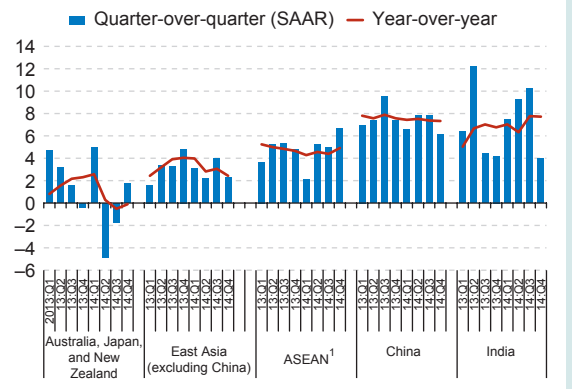
Although India's near-term growth outlook has improved, its medium-term prospects remain constrained by longstanding structural weaknesses. With higher political certainty, improved business confidence, reduced external vulnerabilities and lower commodity prices, real GDP growth (on a 2011/12 National Accounts basis) is forecast to rise to 7.2 percent in FY2014/15, accelerating to 7.5 percent in 2015/16. While several recent policy measures have helped ease supply-side constraints, further measures are needed in the energy, mining, and power sectors. Reforms to streamline and expedite land and environmental clearances, increase labor market flexibility, and simplify business procedures should continue to improve India's business climate, which is crucial for sustaining faster and more inclusive growth. Key policy recommendations encompass the following:

- Durably meeting the inflation target calls for maintaining a tight monetary policy stance together with supporting structural reforms. Despite the recent moderation in inflation, elevated inflation expectations and the possibility of supply-side shocks will continue to challenge achievement of the authorities' medium-term inflation target (4 percent ±2 percent). Therefore, the RBI should maintain its tight monetary policy stance, accompanied by structural reforms to boost food and agriculture production. The recently adopted flexible inflation-targeting regime provides a robust institutional framework for price stability. However, continued progress is needed to strengthen monetary policy transmission to ensure that changes to the policy interest rate are passed through to lending and deposit rates, including by lowering reserve requirements and further reducing the fiscal deficit.
- Fiscal consolidation should continue. The composition of fiscal spending has improved, with an increase in allocations for public investment and reduced outlays on subsidies. However, the FY2015/16 budget, which targets a fiscal deficit of 3.9 percent of GDP (authorities' definition), revises the medium-term roadmap for fiscal consolidation, postponing achievement of the 3 percent of GDP medium-term deficit target by one year to FY2017/18. A strengthened Fiscal Responsibility and Budget Management Act is

needed to underpin the government's medium-term consolidation path. Comprehensive overhaul of food and fertilizer subsidies and measures to raise the tax-to-GDP ratio to precrisis levels remain crucial to finance social and capital spending priorities. The government's strategy to better target subsidies, which relies on direct benefit transfers, increased financial inclusion, and use of the *Aadhaar* (India's unique identification scheme), is expected to yield large savings.

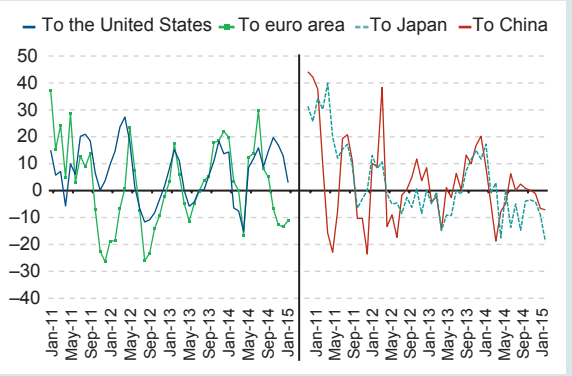
- Enhancing financial sector supervision and monitoring is warranted given the rise in corporate and financial sector strains. The Indian authorities have made progress on implementing Basel III, identifying domestic systemically important banks and imposing capital surcharges on them, improving the resolution of impaired assets, and expanding access to finance. More recently, the RBI moved to lower group credit exposure limits for banks (a key pending recommendation of the IMF's 2012 Financial Sector Assessment Program Update). Nonetheless, further progress is needed to strengthen prudential regulation for banks' asset quality classification, augment capital buffers and improve corporate governance at public sector banks, and strengthen the insolvency framework. Continued efforts are needed to gather information on and analyze the interlinkages between corporate vulnerabilities and banking system health, particularly on the extent of unhedged foreign exchange exposures of large firms with international operations.

Figure 1.30
Asia: Changes in Real GDP at Market Prices
(Percent)



Sources: CEIC Data Co. Ltd.; Haver Analytics; and IMF staff calculations.
Note: SAAR = seasonally adjusted annualized rate.
[1] ASEAN includes Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam.

Figure 1.31
Selected Asia: Exports to Major Destinations
(Three-month percent change of three-month moving average; SAAR)



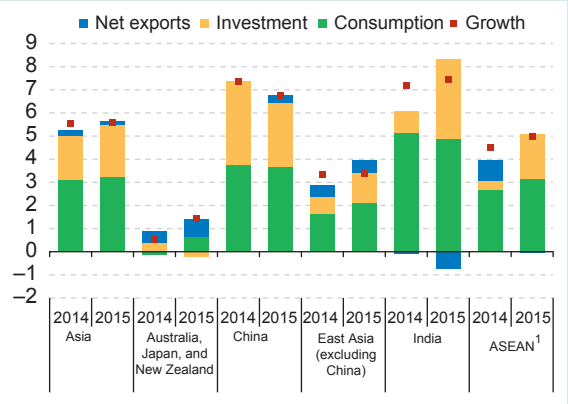
Sources: CEIC Data Co. Ltd.; Haver Analytics; and IMF staff calculations.
Note: SAAR = seasonally adjusted annualized rate. Selected Asia includes China, Hong Kong SAR, Japan, Korea, Malaysia, Taiwan Province of China, Thailand, the Philippines, and Singapore, and East Asia. Indonesia and Vietnam are excluded owing to data lags.

Outlook and Policy Challenges for Asia and Pacific Excluding China and Japan

Recent Macroeconomic Developments in Asia

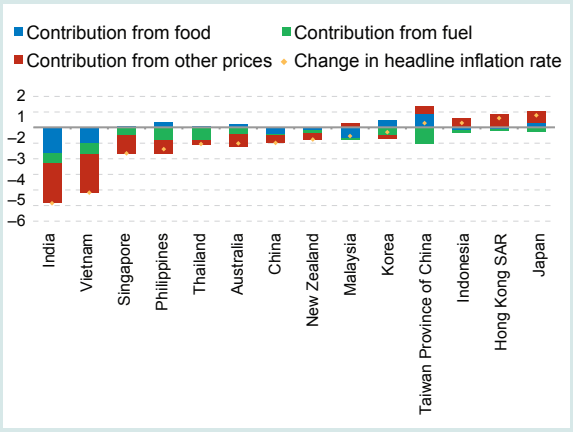
Economic activity softened in the second half of 2014, pulled down by ebbing demand from leading partner countries (Figure 1.30). Exports to several major destinations, particularly China, the euro area, and Japan, have declined, and the pace of export growth to the United States has also lost strength (Figure 1.31). But resilient domestic demand has kept exports to other Asian countries firm. Consumption, in particular, has continued to grow at a solid pace and retail sales across much of Asia have held up (Figure 1.32), supported by

Figure 1.32
Selected Asia: Contributions to Projected Growth
(Year-over-year; percentage points)



Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: The difference between the GDP growth and the sum of components is due to the statistical discrepancy.
[1] ASEAN includes Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam.

Figure 1.33
Asia: Contributions to Change in Headline Inflation in 2014
(Percentage points; end-of-period)



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

high employment, still-accommodative financial conditions, and the boost to real purchasing power from the drop in oil prices. Nonetheless, investment has moderated in a number of economies, including Indonesia, Korea, and Malaysia. Overall, Asia (excluding China and Japan) grew by 5.3 percent in 2014, unchanged from the previous year, reflecting an upward revision of 0.5 percentage point relative to the October 2014 WEO.

Inflation, already generally low across most of the region, has subsided further since late 2014 on the sharp drop in oil prices, while core inflation continues to hold up. Year-over-year headline inflation slowed to 4.5 percent in 2014 in Asia excluding China and Japan on easing growth, stronger exchange rates, and moderating commodity price inflation (Figure 1.33). The decline has accelerated since the fourth quarter, when the effects of oil prices became evident. By February 2015, headline inflation had fallen in most Asian economies. In India and Indonesia, where consumer price increases had been substantially above the regional average, inflation has also cooled. Hong Kong SAR was an exception, until recently, as robust house price increases dominated inflation developments.

In several other countries, removal of energy and food subsidies and hikes in indirect taxes (China, India, Indonesia, Malaysia), and currency depreciations (Australia, Indonesia, Korea, Malaysia) buffered or delayed the decline in inflation. Producer prices—which tend to heavily weight oil and commodities—have been declining in several countries. Nonetheless, low inflation or deflation is apparent in only a small share of items in countries' consumer baskets, suggesting little evidence so far that lower oil prices have migrated into core inflation.

Current account balances have generally increased on the back of improved terms of trade. For Asia excluding China and Japan, the current account surplus rose to 1.8 percent of GDP in 2014, reflecting the sharp late-year drop in the value of oil imports. Higher growth of export volumes also contributed in many countries, despite the more subdued external demand as well as the widespread decline in the trade intensity of global GDP growth that began before the global financial crisis. For commodity importers (including most ASEAN economies), improved terms of trade dominated the dampening effect on trade balances of modest real effective appreciations. Notably in Korea, where export product similarity with Japan is high and export volume growth moderated, the current

account surplus nonetheless strengthened slightly to 6.3 percent of GDP in 2014. However, several commodity producers (Australia, Malaysia, New Zealand) saw their current account balances weaken in the second half of 2014 because of deteriorating terms of trade, even though export volumes held up well.

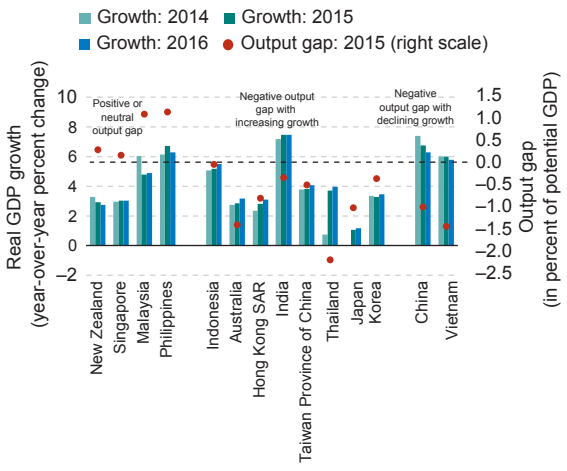
Individual-country developments in 2014 varied considerably across Asia:

- India's growth improved to 7.2 percent in 2014 from 6.9 percent in 2013 amid stronger domestic demand, reflecting resilient private consumption and the incipient recovery in investment helped by stronger confidence and reduced policy uncertainty. This reflects an upward revision relative to the October 2014 WEO of 1.5 percentage points, partly because of changes in the official national accounts statistics.
- Australia's economy grew by 2.7 percent in 2014, and while stronger than the 2.1 percent in 2013, this masks a substantial slowdown in the second half of the year. In turn, this reflects a sharp fall in the terms of trade, the winding down of large resource-related investments, and falling public investment.
- Growth reached 3.3 percent in Korea in 2014, faster than the 3 percent in 2013, but a downward revision relative to earlier estimates. This reflects slowing momentum during the year on fragile household and investor sentiment, which kept the output gap negative.
- Despite robust growth of 4.6 percent, the ASEAN economies' growth momentum lost some steam in 2014. With the exception of Malaysia and Vietnam, activity in the rest of the ASEAN economies decelerated. In Indonesia, weaker net exports and investment activity from the downturn in the commodity cycle eroded growth. In Thailand, policy uncertainty sharply dented domestic demand and exports.
- Frontier and developing economies in Asia and Pacific continued to grow at a moderate clip as financial deepening helped boost investment and consumption. Mongolia was an exception, as the natural resources extraction sector was hit hard by the drop in commodity prices. In the Pacific island countries and small states, growth accelerated on strong credit growth (Bhutan, Fiji), ongoing infrastructure projects, and generally accommodative policies.

Outlook for Asia Excluding China and Japan

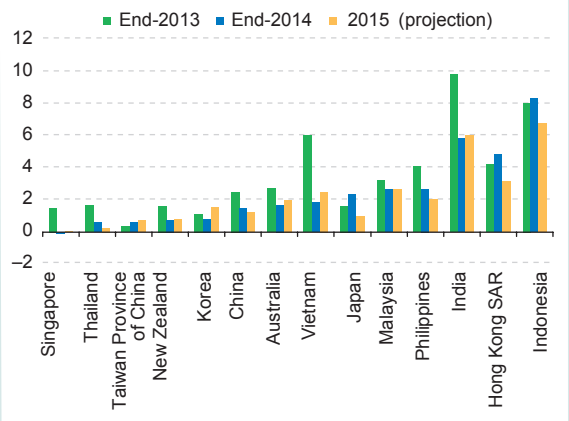
For 2015–16, growth in Asia excluding China and Japan is forecast to pick up sizably. GDP growth is projected to increase to 5.7 percent in 2015 and 5.8 percent in 2016. This is marginally faster than potential growth, helping to narrow output gaps in most economies in which output is below potential (Figure 1.34). In Thailand, however, despite an expected sharp increase in growth, output is expected to remain below potential. Throughout the region, domestic demand is projected to increase strongly, underpinned by tight labor markets and steady credit growth. These forecasts represent upward revisions of 0.3 percentage point for 2015 and 2016 from October 2014 WEO forecasts. This in turn reflects the boost to real disposable income and domestic demand from lower commodity prices and the upward growth

Figure 1.34
Selected Asia: Real GDP Growth and Output Gap
(Percent)



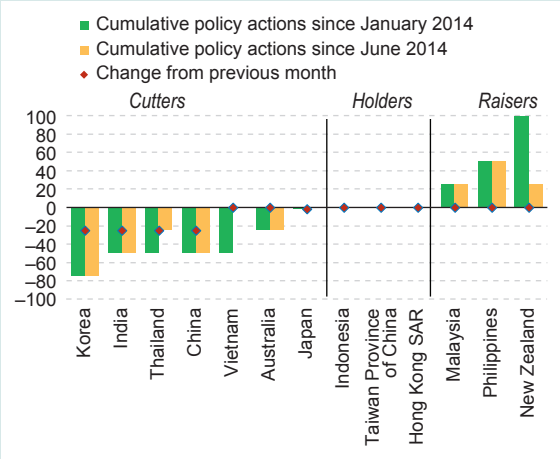
Sources: IMF, World Economic Outlook database; and IMF staff estimates.

Figure 1.35
Asia: Headline Inflation
(Year-over-year change; percent)



Sources: CEIC Data Co. Ltd.; Haver Analytics; IMF, World Economic Outlook database; and IMF staff calculations.
Note: India's 2015 projection is on a fiscal-year basis.

Figure 1.36
Selected Asia: Policy Rate Actions
(Basis points)



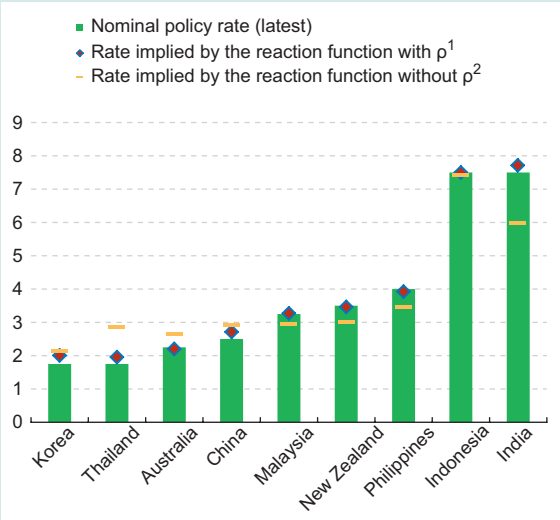
Sources: Haver Analytics; and IMF staff calculations.
Note: For Japan, the uncollateralized overnight rate is used; ordered by cumulative policy actions since January 2014.

revisions in major advanced economies, which offsets the impact of a steeper slowdown in China and other major non-Asian emerging market economies and is reflected in a markdown of export growth forecasts.

Inflation is expected to stabilize around 4½ percent in Asia excluding China and Japan in 2015. Inflation developments will primarily reflect the pass-through of oil price declines and exchange rate movements (Figure 1.35). Indeed, in Australia, New Zealand, and the Philippines, inflation is expected to temporarily fall below the official central bank target before beginning to pick up in late 2015 on rising world oil prices.

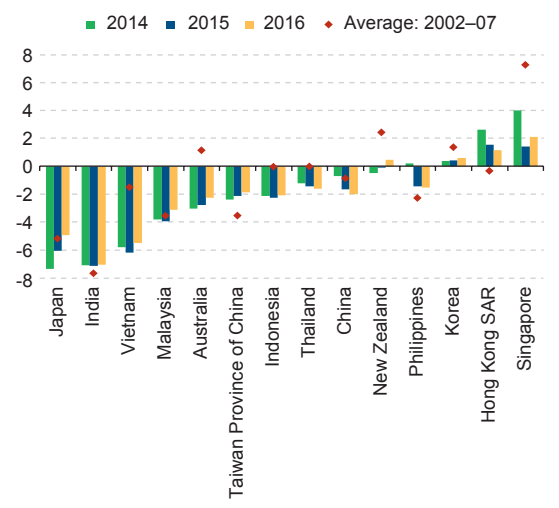
Monetary and fiscal policies are generally supportive. Numerous central banks across the region relaxed monetary policy by cutting interest rates in recent months (Australia, India, Indonesia, Korea, Thailand) or slowing the crawl of the nominal effective exchange rate band (Singapore—Figure 1.36). Policy interest rates are broadly in line with or somewhat below levels implied by Taylor rules based on past central bank behavior, notwithstanding recent declines in inflation (Figure 1.37). On the fiscal front, cyclically adjusted government balances are projected to consolidate modestly relative to 2014 (Figure 1.38), except in

Figure 1.37
Asia: Estimated Central Bank Reaction Functions
(Percent)



Sources: Haver Analytics; and IMF staff estimates.
Note: Estimated as of April 2, 2015, with monthly data.
[1] Estimated as $i_t = \rho^* i_{t-1} + (1-\rho)^*(\alpha + \gamma_1 E_t[\pi_{t+1} - \pi^*] + \gamma_2 E_t \text{Output Gap}_{t+1} + \delta_1 \text{REER}_t + \delta_2 \text{US\_3Myield}_t) + \varepsilon_t$.
[2] Estimated as $i_t = \alpha + \gamma_1 E_t[\pi_{t+1} - \pi^*] + \gamma_2 E_t \text{Output Gap}_{t+1} + \delta_1 \text{REER}_t + \delta_2 \text{US\_3Myield}_t + \varepsilon_t$.

Figure 1.38
Selected Asia: Cyclically Adjusted Fiscal Balance
(Percent of GDP)



Sources: IMF, World Economic Outlook database; and IMF staff calculations.

the Philippines, where previous bottlenecks that sharply curtailed spending are expected to ease.

While global factors, such as lower commodity prices and tighter financial conditions, will affect the region, country-specific factors will also shape the outlook:

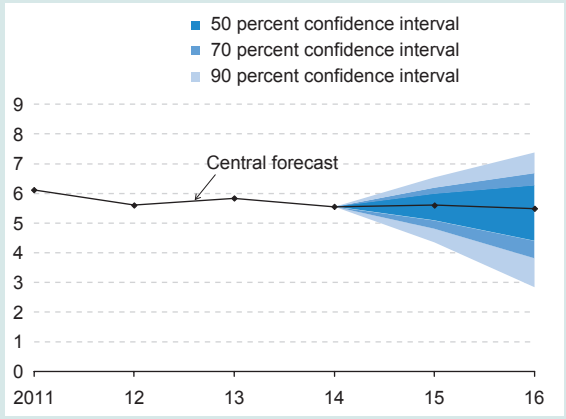
- India's growth is expected to strengthen to 7.5 percent in 2015 and 2016, benefiting from recent policy reforms, a pickup in investment, and lower oil prices. The last factor will raise real disposable incomes, particularly those of poorer households, providing a support to consumption.
- The downturn in the global commodity cycle will continue to affect Australia's economy, with related investment coming off historic highs. However, supportive monetary policy and a weaker exchange rate will underpin non-resource activity, helping to edge up growth in 2015 to 2.8 percent, rising to 3.2 percent in 2016 (broadly unchanged from projections in the October 2014 WEO).
- In Korea, growth is likely to remain lackluster at 3.3 percent in 2015, before edging up to 3.5 percent in 2016, down by ½ percentage point since the October 2014 WEO. This reflects lingering cautious private sector sentiment and the delayed impact on exports of shifts in regional exchange rates, as well as the dividend from lower oil prices.
- Growth in ASEAN economies is expected to recover to 5.1 percent in 2015 and 5.3 percent in 2016, but trends among individual countries will continue to diverge. Indonesia's growth is forecast to rise modestly in 2015 to 5.2 percent (though lower than previously projected) and to increase further in 2016 as reforms are implemented. Malaysia's growth is expected to slow this year to 4.8 percent on weaker terms of trade and household deleveraging. Thailand is expected to recover strongly, with growth reaching 3.7 percent, on greater clarity regarding near-term policies, while the growth forecast for the Philippines has been revised upward by nearly ½ percentage point to 6.7 percent for 2015 on more robust consumption from the oil price windfall and carryover from the very strong outturn in the fourth quarter of 2014.
- Asia's frontier and developing economies are projected to pick up modestly in 2015. In Papua New Guinea, the coming on stream of a large natural gas project is forecast to provide a one-time boost, raising growth to nearly 20 percent. Growth in the Pacific island countries and other small states is also expected to be robust. Rebuilding from Cyclone Pam, which inflicted a devastating social and economic toll on Vanuatu in March 2015, is expected to underpin growth over the next few years, despite the large income losses in agriculture, which was destroyed (see Box 1.9). By contrast, low commodity prices are expected to curtail Mongolia's growth sharply to 4.4 percent in 2015, a downward forecast revision of 4 percentage points.

Are the Risks to Asia's Outlook Rising?

While Asia and Pacific's outlook remains solid, the balance of risks is tilted to the downside (Figure 1.39):

- *Slower-than-projected growth in China and Japan.* Given these economies' large size and deep trade and financial linkages with other

Figure 1.39
Asia: Real GDP Growth
(Central forecast and selected confidence intervals; percent)



Sources: IMF, World Economic Outlook database; and IMF staff estimates.

countries, substantially slower growth than currently projected for China or Japan would affect the rest of the region and the world economy, particularly those countries with strong supply chain links and commodity exporters. Asia's medium-term growth prospects could also be trimmed. With cross-border credit exposures to China rising rapidly in recent years, particularly from banks in Hong Kong SAR and Singapore, credit concerns could spill over to liquidity and funding conditions in the rest of the region. More generally, spillovers from China to local equity returns and volatility in the rest of Asia have recently risen. Moreover, empirical evidence presented in Chapter 3 in the April 2014 *Regional Economic Outlook: Asia and Pacific* suggests that a 1 percentage point reduction in China's GDP growth would trim growth in other Asian economies by 0.3 percentage point on average (and 0.4 percentage point in the ASEAN-4) in the following year. If Japan is unable to sustain a growth liftoff, this could also have substantial adverse effects on those economies with which it has strong trade, FDI, and financial links, such as Indonesia, Korea, and Thailand. On the other hand, if Japanese growth continues to disappoint, outward FDI could increase if Japanese firms decide they prefer to invest abroad.

- *Persistent dollar strength against the euro and the yen.* Sustained realignments of the major reserve currencies could pose a growth risk to Asia. Higher U.S. interest rates and a strengthening dollar will exert an autonomous tightening on domestic financial conditions in the region through the global reallocation of capital, which is likely to outweigh the support from renewed monetary easing by the European Central Bank and the Bank of Japan. This tightening may prove unwelcome if it coincides with slowing regional growth and declining inflation, although any resulting exchange rate depreciation would provide some near-term growth cushion. A strong dollar would also imply higher debt-service costs for less than fully hedged firms with sizable dollar-denominated debt and could make rolling over maturing debt more difficult. Profit margins in economies that have seen real effective appreciations and that export products similar to those of the euro area or Japan (such as China and Korea) may be squeezed and their export market shares somewhat eroded. These effects could be magnified if reserve-currency exchange rates diverge further or another major economy in the region adjusts its exchange rate substantially.[7]
- *Side effects of global financial and inflation conditions.* Increased corporate and household leverage and elevated real estate and equity prices

[7] However, widespread participation in global value chains across the region complicates the assessment of how changes in the value of the major currencies will affect individual countries' competitiveness. This will depend, among other things, on the exchange rate behavior of others in the same chain and whether final products are priced to market (and to which market). It is therefore possible that global value chain participants whose products are sold mainly in the United States at prices fixed in dollars could see little erosion of effective competitiveness even if their currencies strengthened against the euro and the yen. In addition, countries participating in a common global value chain may wish to limit the variability of their cross exchange rates over time.

within Asia raise sensitivity to expected and unexpected changes in monetary policies abroad and possible volatility surges, including those that could arise from global and regional geopolitical tensions. Similarly, if the current global setting of low inflation becomes entrenched or morphs into outright deflation and is imported into Asia, real debt burdens would increase further. The resulting higher debt-servicing costs and reduced rollover rates would affect corporate profitability and investment and, for households, could substantially drag on consumption, particularly if house prices also drop (Box 1.10). As U.S. growth improves, interest rates and spreads are likely to rise, increasing Asia's domestic borrowing costs. Empirical evidence suggests that changes in global risk aversion strongly affect exchange rate, equity price, and government bond yield volatilities (Box 1.11).

- *Greater upside from lower oil prices*. On the positive side, the decrease in oil prices could spur growth more to the upside than currently envisaged if (1) current forecasts overstate country-specific restraints on spending or (2) the supply contribution to price declines is larger or more persistent than envisaged.

Policy Requirements in Asia Excluding China and Japan

While policies should be tailored to country-specific conditions, several general messages emerge for the region. Based on projected growth and inflation outlooks, current policy interest rates across the region are broadly appropriate. However, some tightening is appropriate to address fiscal sustainability and financial stability concerns, in addition to the risk of renewed global financial market turbulence. That said, policy easing is appropriate in countries where cyclical conditions point to sizable excess capacity and slowing growth. Asia excluding China and Japan is well equipped to supply policy stimulus if required, being in the enviable position of having nominal policy rates generally well above the zero lower bound and fiscal positions that have been fortified in recent years. Nonetheless, policies are needed to avert further decline in long-term growth rates.

- *Monetary policy* decisions will need to navigate several (possibly countervailing) considerations: oil price developments, capital flow volatility risk, and moderating potential growth.
    - The decline in headline inflation coming solely from the drop in *oil prices* does not warrant an offsetting policy interest rate response, as this would negate the boost to consumers' real purchasing power coming from lower oil prices. In addition, the downward impact on inflation is expected to be temporary, with headline inflation beginning to recover later this year. Moreover, real policy interest rates based on core inflation (as a proxy for inflation expectations) have risen only marginally in recent months. Nonetheless, looser monetary policy is appropriate if lower oil prices risk migrating to core inflation, medium-term inflation expectations, or both, especially in economies in which output gaps are currently negative (Australia, Japan, Korea, Thailand). Policy recommendations should be reevaluated if assumptions regarding the size and duration of the oil price shock are revised.
    - In the event of a *capital flow reversal*, central banks with strong policy credibility can afford to relax monetary policy to cushion the blow to growth from tighter financial conditions. However, where inflation or inflation expectations remain relatively high (such as in India and Indonesia), a tightening bias may be warranted to help anchor inflation expectations by limiting downward pressure on the exchange rate.
    - While monetary policy is broadly in line with historical patterns suggested by estimated Taylor rules, this may overlook the possibility that real neutral rates may have eased in Asia—as elsewhere—since the global financial crisis as a result of

moderating potential growth (Box 1.12), suggesting some latent tightening of policy if this factor is ignored. In addition, *individual banks' characteristics* will influence the transmission of monetary policy, with financially stronger banks being less sensitive to central banks' interest rate decisions (Box 1.13).

- *Exchange rate and intervention policies*. Consistent with their role as shock absorbers, exchange rates should be permitted to adjust to shifts in balance of payments flows due to, among other things, changes in commodity prices and capital flows, including from asynchronous monetary policies in advanced economies. However, movements away from equilibrium should be limited if real exchange rates are initially over- or undervalued, although some persistent undershooting may be warranted in situations in which monetary policy is constrained by the zero lower bound and fiscal and structural policy space is limited or operates with an undue delay. Nonetheless, foreign exchange intervention should remain in the tool kit to address disorderly market volatility, especially in cases in which temporary overshooting threatens financial stability, provided it does not substitute for appropriate monetary, fiscal, or structural policies. Moreover, in view of the rising opportunity cost of holding reserves, further accumulation should be based on cost-benefit considerations. In addition, reserve holdings, which tend to be sterilized, entail a direct cost for central banks, especially in an environment of low returns on international assets.

- *Financial and macroprudential policies*. In addition to strong microprudential supervision and regulation, protecting financial stability will require proactive use of macroprudential policies to increase resilience to shocks and contain the buildup of systemic risk associated with changes in financial conditions. In fact, greater reliance on macroprudential policies may be needed where the financial cycle is not well synchronized with the real economy cycle (Australia, Hong Kong SAR, Korea), which may be more likely in the presence of strong unconventional monetary policies in the major economies. To avert overheating or overinvestment in real estate that could threaten the stability of financial systems, eliminating the preferential tax treatment of real estate (for example, by raising taxes on real estate capital gains) and tightening regulations on credit financing for real estate development and purchase (for example, imposing binding loan-to-value limits and debt-service-to-income ceilings) are advised. Macroprudential policies and capital flow measures should not substitute for appropriate macroeconomic policy reactions to volatile capital flows and asset price swings.

- *Fiscal policies* will need to navigate several priorities:

  - *Improving the structure of the budget*. Following the lead of Indonesia and Malaysia, current low fuel and food prices provide a window of opportunity to further reform or phase out subsidies on these products, which tend to be poorly targeted, thereby improving spending efficiency and shielding public spending from future price fluctuations (Thailand, and additional subsidy reduction in India, Indonesia, and Malaysia). Increasing reliance on broad-based taxes—as in India and Malaysia, where progress toward introducing a goods and services tax is being made—will reduce dead-weight losses and make fiscal revenue less volatile. For some vulnerable low-income countries, including the Pacific island economies, strengthening fiscal policy frameworks would help reduce the impact of volatile commodity prices and improve the capacity to manage fiscal risks from natural disasters and climate change (Box 1.14).

  - *Managing fiscal space*. Whether countries should consolidate to build fiscal space or increase fiscal spending to provide temporary stimulus or support potential growth will depend on individual circumstances. Countries with elevated

public sector debt should continue to consolidate (India, Malaysia, Vietnam), but a slower pace is appropriate if cyclical conditions are weak, fiscal multipliers are large, and monetary policy effectiveness is low. Countries with high private sector debt, especially if it is denominated in foreign currencies, should ensure adequate fiscal buffers to absorb any potential quasi-fiscal costs. Moreover, in view of investors' observed tendency to differentiate across countries according to the soundness of underlying policies, reducing fiscal vulnerabilities is also likely to lessen external risks. On the other hand, fiscal stimulus, or a slower pace of consolidation, may be appropriate for economies facing temporary adverse terms-of-trade shifts or where output is below the full-capacity level (Australia, Korea). But care should be taken to ensure that stimulus is reversed during cyclical upturns and to avoid conflating weaker potential growth with a temporary growth dip. Asian emerging market economies with large infrastructure gaps should consider prioritizing public investment spending over easing monetary policy (ASEAN countries excluding Singapore). Overall, however, given still-solid growth outlooks in many economies, further strengthening cyclically adjusted fiscal positions should remain a policy goal.

- *Structural reforms* are needed to restart productivity gains across the region. Reforms also hold the promise of rebalancing growth toward domestic demand, which remains a priority for some Asian economies. In countries where demand is weak, combining structural reforms with temporary macroeconomic policy stimulus would avoid adding to excess capacity and deflation risks (Korea, Singapore, Thailand). For faster-growing countries, including India, several ASEAN economies, and most Asian frontier and developing economies, addressing supply bottlenecks by expanding essential infrastructure and undertaking deregulation of key sectors would help to sustain growth, helping these countries to avoid the middle-income trap. In Vietnam, for instance, comprehensive reform of state-owned enterprises and public sector banks is needed to achieve greater private sector participation and more efficient financial intermediation.

Box 1.1

Asia's Export Performance: What Is Holding It Back?

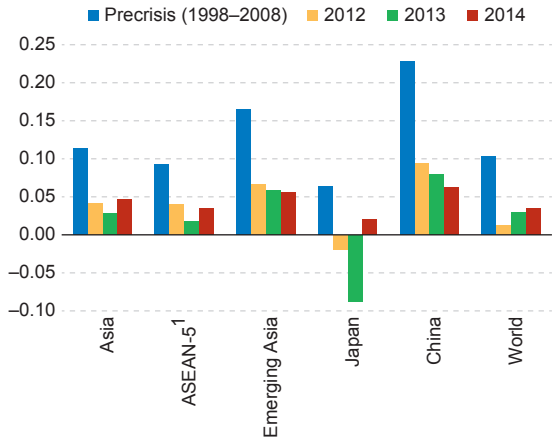
Export growth in Asia has slowed markedly in recent years. Amid slower global export performance, Asia's export growth dropped to an average rate of 4 percent during 2012–14, after averaging 11 percent in the 10 years before the global financial crisis (Figure 1.1.1). This box explores the causes of the export slowdown in Asia (and globally) and finds that slower growth in external demand and shifts in the composition of expenditure, as well as maturation of cross-border supply chains, all play a role.

Weaker partner-country demand has been one of the main causes of Asia's recent export slowdown. Growth in advanced economies, and more recently, in major emerging markets has been markedly slower than before the global financial crisis. As a result, major Asian economies' trading-partner demand in 2014 was 6–8 percentage points below levels implied by a continuation of trend trade-partner growth during 2000–08 (Figure 1.1.2).

Shifts in the composition of world demand have also slowed Asia's export growth. The import content of different expenditure components of aggregate demand varies, and the composition of demand has changed markedly since the global financial crisis. In particular, investment and exports—which have relatively high import contents on average—have grown more slowly than private consumption and government spending,[1] leading to slower growth of exports than of partner-country final demand (Figure 1.1.3).

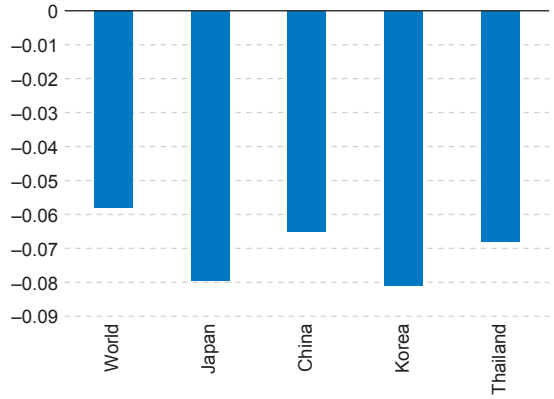
To examine the reasons for the export slowdown more systematically, this box uses a dynamic panel model to estimate the elasticity of exports with respect to trade-partner income. The real effective exchange rate of the exporting country is included as a control variable.[2] The results indicate that the long-term elasticity of exports to partner income had declined even before the global financial crisis (Table 1.1.1).[3] Prior to the Asian financial crisis, the long-term income elasticity was 1.6,

Figure 1.1.1
Selected Asia: Export Growth Rates



Sources: UNCTADstat; and IMF staff calculations.
[1] ASEAN-5 comprises Indonesia, Malaysia, the Philippines, Singapore, and Thailand.

Figure 1.1.2
Deviation of Trading Partner's Demand in 2014 from the Trend



Sources: IMF, Global Economic Environment database; and IMF staff calculations.

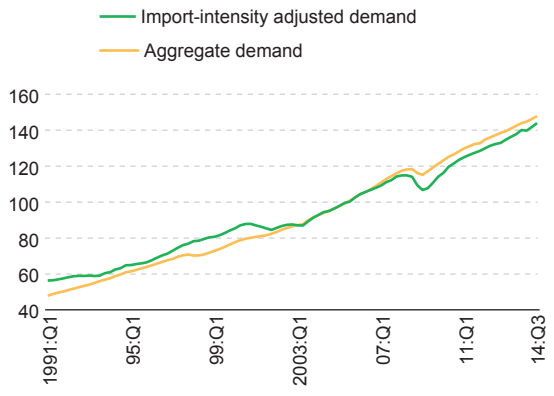
Prepared by Gee Hee Hong and Joong Shik Kang.
[1] See Bussière and others (2013) for details.
[2] A dynamic panel model is estimated using a set of quarterly data of trading-partner demand and real effective exchange rates for 14 Asian countries from the first quarter of 1980 to the third quarter of 2014. Country and time fixed effects are included and the generalized method of moments estimator suggested by Arellano and Bond (1991) is used.
[3] Constantinescu, Mattoo, and Ruta (2015) find a similar result for the global trade.

Box 1.1 *(continued)*

Figure 1.1.3

Japan: Trading Partners' Demand

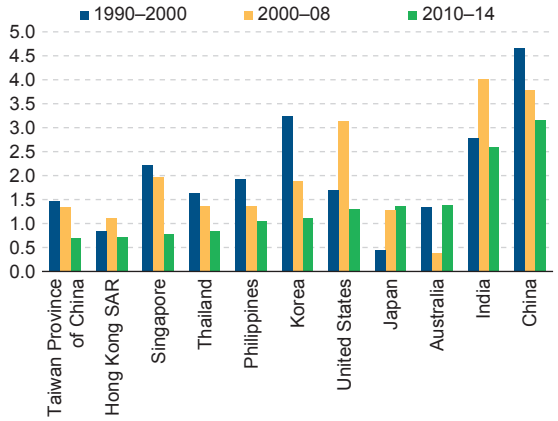
(2005 = 100)



Sources: Bussière and others (2013); Haver Analytics; and IMF staff calculations.

Figure 1.1.4

Long-Term Export Income Elasticity



Sources: IMF, *Information Notice System;* IMF, Global Economic Environment database; UNCTADstat; and IMF staff calculations.

Table 1.1.1 Dynamic Panel Estimation: Income Elasticity (Arellano-Bond GMM)

Time-Horizon	(1) 1980–2014	(2) 1980–98	(3) 2000–14
Lag of export (α)	**0.969***** (91.989)	**0.881***** (14.101)	**0.945***** (83.597)
Trading-partner demand (β)	**0.040**** (2.196)	**0.189*** (1.838)	**0.064***** (3.623)
Real effective exchange rate	**–0.029**** (–2.051)	**–0.091**** (–2.530)	**–0.007** (–0.451)
Constant	**0.105** (1.119)	**0.114** (0.400)	**0.004** (0.051)
Long term income elasticity (β/(1 – α))	**1.29**	**1.59**	**1.16**
Number of observations	1,194	506	648
Number of countries	14	12	14

Sources: IMF staff estimates.
Note: Robust *z*-statistics are in parentheses. GMM = generalized method of moments.
*p < 0.1; **p < 0.05; ***p < 0.01.

and came down to 1.2 during 2000–14. In addition, country-specific error correction model estimates show that for most Asian economies, exports have become less sensitive to external demand growth since the early 2000s, while a further decline in income elasticity is evident since the global financial crisis (Figure 1.1.4).[4]

What is behind this decline in the income elasticity of exports? In China, a major player in Asian supply chains, the pace of cross-border fragmentation of production began to slow from the mid-2000s as domestically sourced intermediates (from either locally owned producers or subsidiaries of foreign firms) increasingly replaced imported intermediate goods (Kee and Tang 2014). To capture the impact of this development on the elasticity of exports to partner income, the panel regression is augmented by adding the ratio of imported "parts and accessories" to gross exports. A decline in this ratio would suggest diminished reliance on imported intermediate goods. The estimation results indicate that a 1 percentage point increase in the ratio of imported parts and accessories to gross exports is associated with a 0.013 decline in income elasticity. Since the mid-2000s, the ratio has declined from 25 percent to 15 percent in the region, accounting for a modest decline in income elasticity of about 0.1 over this period—about one-quarter of the total decline. Therefore, factors other than slowing cross-border fragmentation of production have also contributed to lowering the response of exports to demand from trading partners, possibly including increased protectionism and narrowing of cross-country wage differentials.

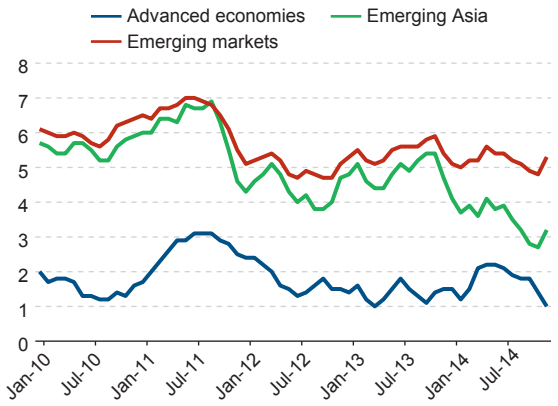
[4] Long-term income elasticity is estimated using a dynamic panel regression as follows (all variables are in log terms): $x_{it} = \alpha + \beta x_{i,t-1} + \gamma y^*_{i,t} + \delta \text{REER}_{it} + \varepsilon_{it}$ in which real exports are regressed on external demand using trading partners' demand and real effective exchange rate.

Box 1.2

Low Inflation in Asia: What Role for Oil Prices and Exchange Rates?

Recent months have witnessed substantial shifts in major world prices. Commodity prices, particularly that for oil, have fallen sharply since mid-2014, while the exchange rates of major currencies are following widely divergent paths. At the same time, inflation across the world has been on a downward trend, with rates in Asia declining by about 1 percentage point since mid-2014 and with larger falls in Asian emerging market economies (Figure 1.2.1). This widespread disinflation trend suggests a role for global factors. This box explores the nature of these global common factors and their contribution to recent disinflation in Asia (with the residual explained by country-specific factors) and forecasts the likely future path of common inflation.

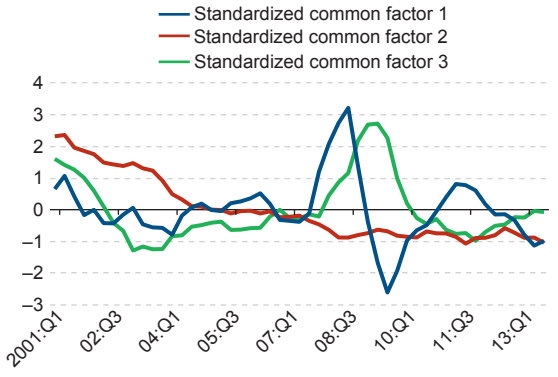
Figure 1.2.1
World: Headline Consumer Price Index Inflation
(Percent, year over year)



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

The approach is to apply a latent-factor model to the inflation rates of 62 advanced and emerging market economies from the first quarter of 2001 to the third quarter of 2013 to identify the global common drivers of inflation and their importance for individual countries (see IMF 2014a for the technical details). These common drivers are then associated with key global variables to forecast future common inflation. Factor models transform a large number of covarying series into a smaller set of orthogonal common factors so that each successive factor explains as much as possible of the remaining variation in the observed series. The observed series can thus be expressed as the weighted sum of the common factors plus a country-specific term. The optimal number of common factors in the sample, chosen using standard selection criteria, is three, and together they explain 62 percent of the variance in headline inflation in the full cross-country panel sample. The first common factor explains 34 percent of the total variability, with the second and third common factors explaining 18 percent and 10 percent, respectively (Figure 1.2.2). While the identified common factors are a statistical construct, they can often be associated with observed economic variables that theory suggests are relevant.

Figure 1.2.2
Three Latent Common Factors
(Percent, year-over-year)



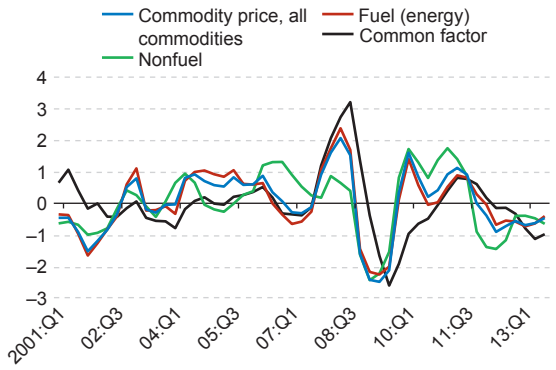
Sources: IMF, World Economic Outlook database; and IMF staff calculations.

Common factor 1 appears to fit the behavior of global commodity prices, measured in dollars, well (Figure 1.2.3). The fit is especially strong since 2006, corresponding to a period with large swings in the prices of food and fuel. Common factor 2 displays a downward trend during 2001–07, with stabilization thereafter (Figure 1.2.4). This factor can be regarded as indicative of the "great moderation" in inflation brought about by increased globalization

Prepared by Jaime Guajardo and Rachel van Elkan.

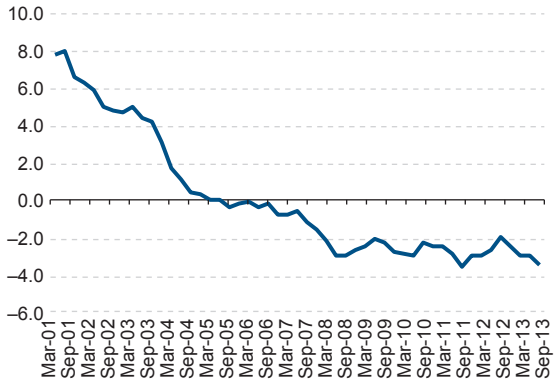
Box 1.2 *(continued)*

Figure 1.2.3
Factor 1 and Commodity Prices
(Percent, year-over-year)



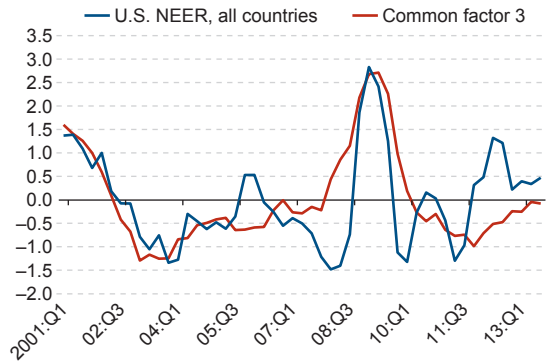
Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: All commodity price index, 2005 = 100, includes fuel and nonfuel prices indices; nonfuel price index, 2005 = 100, includes food and beverages and industrial inputs price index; fuel (energy), 2005 = 100, includes crude oil (petroleum), natural gas, and coal price indices.

Figure 1.2.4
Factor 2: Great Inflation Moderation
(Percent, year-over-year)



Sources: IMF, World Economic Outlook database; and IM staff calculations.

Figure 1.2.5
Factor 3 and U.S. Nominal Effective Exchange Rate (NEER)
(Percent, year over year)



Sources: IMF, World Economic Outlook database; and IMF staff calculations.

and offshoring of production, and the aftermath of a wave of emerging market crises and transitions from central planning. Common factor 3 can be associated with movements in the nominal effective exchange rate of the dollar (Figure 1.2.5). This is consistent with the fact that the dollar serves as numeraire for a large share of international trade, with movements in the U.S. nominal effective exchange rate passed through to local-currency prices according to country-specific monetary and exchange rate frameworks.

The importance of a specific common factor is permitted to vary by country. The weight is given by the loading coefficients, which are assumed to be constant over the entire period and loaded contemporaneously. A higher loading factor indicates that the country's inflation is influenced more heavily by that factor. Differences in inflation across countries may thus reflect not only country-specific factors, but also differences in the loadings of the common factors. Figure 1.2.6 reports the loadings for Asia for the three common factors. The loadings for factor 1 are positive and sizable for almost every country, indicating the importance of world fuel and food prices for inflation, while the loadings for factor 2 tend to be negative for emerging Asia, possibly reflecting upward wage pressures from increased involvement in regional supply chains. Loadings for the third common factor are mixed in sign, though generally small, with the pattern suggestive of the response of local-currency exchange rates to dollar appreciation.

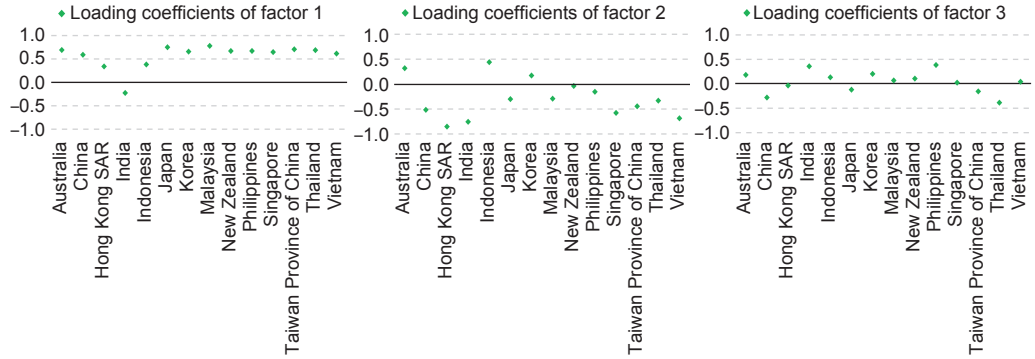
As noted previously, the three common factors explain 62 percent of the variability of global inflation. But their combined explanatory power varies across countries (Figure 1.2.7). At the upper end, common factors explain 83 percent of inflation variability in Vietnam, while at the lower end, common factors explain only 35 percent of inflation variability in Indonesia. Combining the common factors and their country-specific loadings, one

(continued)

Box 1.2 *(continued)*

Figure 1.2.6

Loading Coefficients of Factors 1, 2, and 3 in Asia

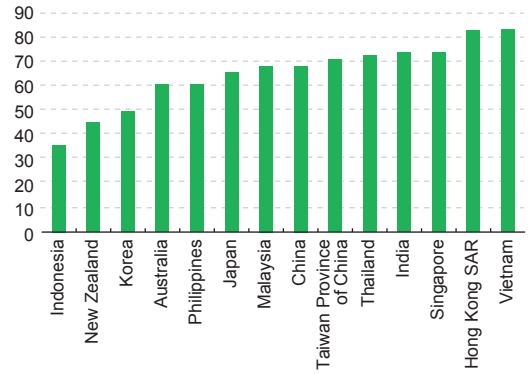


Source: IMF staff estimates.

Figure 1.2.7

Variability of Inflation Explained by the Common Factors

(Percent)



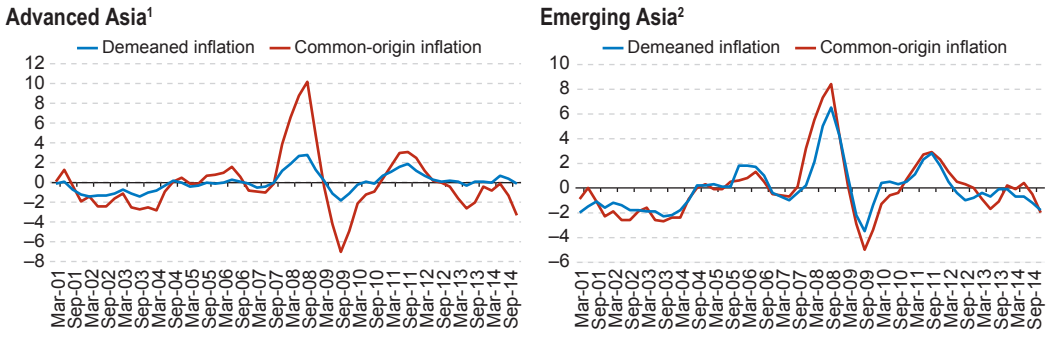
Sources: IMF, World Economic Outlook database; and IMF staff calculations.

can construct the level of common-origin inflation. Figure 1.2.8 shows that common factors track inflation developments well in emerging Asia, possibly reflecting the large share of food and fuel in these economies' consumption baskets. However, inflation in advanced Asia varies less than common-origin inflation, which may reflect the effectiveness of countercyclical monetary policies. Extrapolating this model to 2014 (using actual developments in the common factor proxies between the fourth quarter of 2013 and fourth quarter of 2014) suggests that common factors pulled inflation down sharply in emerging Asia in the latter part of 2014. However, country-specific factors, including possibly some smoothing of price adjustments, buffered the downward trend in advanced Asia, resulting in a more limited drop in actual inflation.

Figure 1.2.8

Asia: Actual and Common-Origin Inflation

(Percent)



Source: IMF staff estimates.

[1] The sample includes Australia, Hong Kong SAR, Japan, Korea, New Zealand, Singapore, and Taiwan Province of China.

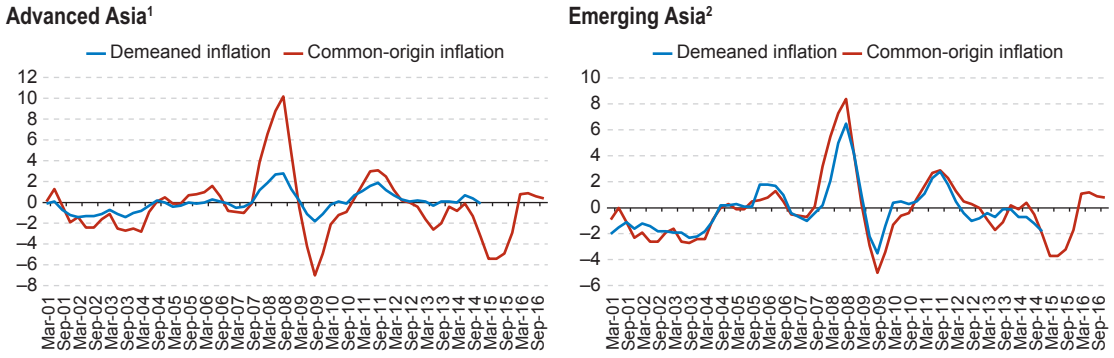
[2] The sample includes China, India, Indonesia, Malaysia, Philippines, Thailand, and Vietnam.

Box 1.2 *(continued)*

Figure 1.2.9

Asia: Actual and Common-Origin Inflation

(Percent)



Source: IMF staff estimates.

[1] The sample includes Australia, Hong Kong SAR, Japan, Korea, New Zealand, Singapore, and Taiwan Province of China.

[2] The sample includes China, India, Indonesia, Malaysia, Philippines, Thailand, and Vietnam.

As a next step, this estimated model is used to project common-origin inflation for Asia during 2015–16. The April 2015 *World Economic Outlook* assumptions for fuel and food prices, and for the U.S. nominal effective exchange rate, are used to represent factors 1 and 3.[1] Factor 2 is assumed to remain unchanged at its third-quarter 2013 level. There are two opposing forces affecting common-origin inflation in Asia. The forecast steep drop and partial recovery in fuel prices pulls down common-origin inflation in 2015 and raises it in 2016, while the expected increase in the U.S. nominal effective exchange rate pulls up common-origin inflation in 2015. On balance, for Asia as a whole, the behavior of oil prices dominates (Figure 1.2.9), leading to a substantial decline in common-origin inflation in 2015 and a bounce back in 2016. As in the past, overall inflation in emerging Asia can be expected to closely track the path of common inflation, provided country-specific factors (including policy responses), as well as commodity price pass-through and exchange rate frameworks—both of which affect common-origin inflation—do not change materially. On the other hand, overall inflation in advanced Asia may not fall and rebound by as much as predicted by common-origin inflation because of the greater importance of idiosyncratic factors for Asian advanced economies, including domestic monetary policies.

[1] The April 2015 *World Economic Outlook* assumes that the movements in the U.S. nominal effective exchange rate fully offset the inflation differential between the United States and its trading partners, so that the U.S. real effective exchange rate remains constant over the forecast horizon.

Box 1.3

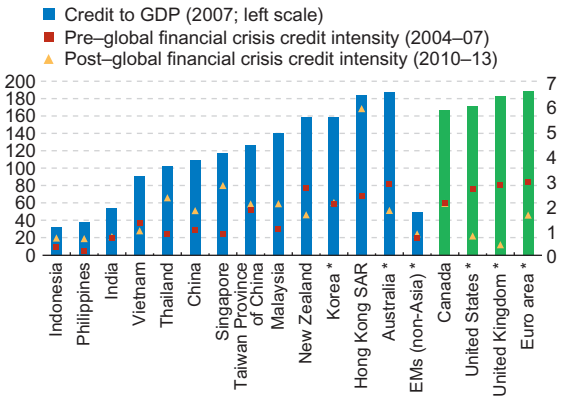
The Rising Credit Intensity of Output within Asia

Credit growth in a number of Asian economies has accelerated since the global financial crisis, fueled by low interest rates and capital inflows. However, in several Asian economies, especially some in the Association of Southeast Asian Nations (ASEAN), this faster increase in credit has been associated with smaller gains in output than in the past. This is reflected in an increase in the credit intensity of GDP—the change in credit-per-unit increase in GDP—and points to a decline in the stimulative effect of credit in the postcrisis period.

Figure 1.3.1

Credit Intensity of GDP: Pre– and Post–Global Financial Crisis

(Percent for credit to GDP; simple ratio for credit intensity of GDP)



Sources: Bank for International Settlements, Credit to the Private Sector and Locational Banking Statistics; Dealogic; IMF, *International Financial Statistics*; IMF, World Economic Outlook database; and IMF staff calculations.
Note: Eurozone countries include Austria, Belgium, France, Germany, Italy, the Netherlands, and Luxembourg. EMs (non-Asia) = emerging market economies outside Asia, including Brazil, Mexico, Russia, Turkey, and South Africa. "*" denotes countries and country groups (only Mexico for non-Asian EMs) for which comprehensive Bank for International Settlements data on total private credit are available.

Figure 1.3.1 compares the average credit intensity of GDP in the period before and after the global financial crisis.[1] Prior to the global financial crisis, advanced economies and the euro area shared similar credit-to-GDP ratios, while the marginal impact of credit on output was also comparable. On the other hand, emerging markets tended to share a similar credit intensity of GDP before the global financial crisis—though much smaller than that for advanced economies—despite considerable divergence in their credit-to-GDP ratios.

Since the global financial crisis, the credit intensity of GDP has risen in China, Taiwan Province of China, the larger ASEAN economies, and the financial centers of Hong Kong SAR and Singapore—very sharply, in some instances. Credit intensity in these economies has now approached, and in some cases surpassed, that in advanced economies and the euro zone prior to the global financial crisis. This contrasts with some of the advanced economies within the Asia and Pacific region, such as Australia and New Zealand, in which credit intensity has recently fallen. In other Asian emerging markets, credit intensities have remained broadly stable.[2] No systematic relationship is apparent between initial credit-to-GDP ratios and rising credit intensity, suggesting that country-specific factors may be at play. Possible explanations include the following.

Change in credit allocation: Shifts in the allocation of new lending may be a factor in declining credit intensity. For example, if credit is used to fund purchases of existing real assets (including real estate) or to finance purchases of financial assets, the impact on GDP could be smaller than if credit is spent on consumption or investment in physical capital. This factor may be more relevant in economies in which the supply of new housing is restricted by

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Prepared by Christiane Kneer and Elif Arbatli.

[1] For advanced economies and some emerging markets, credit to the nonfinancial private sector is obtained from the Bank for International Settlements' total credit series derived from financial accounts, which is a comprehensive measure including all forms of loans and debt securities provided by all financial and nonfinancial corporations, general government, households, and nonprofit institutions serving households and foreigners. For other countries, credit to the nonfinancial private sector is obtained as the sum of claims of banks on the nonfinancial private sector, cross-border loans to the nonfinancial sector by internationally active banks (both from the Bank for International Settlements), and the stock of debt securities issued to nonfinancial corporations (from Dealogic).

[2] In emerging markets outside Asia, credit intensity has been stable on average but has risen in some large emerging markets.

Box 1.3 *(continued)*

zoning or land constraints, in financial centers, and in countries that recently received credit rating upgrades. Shifts in credit allocation toward industries with longer gestation periods for investment (possibly reflecting the adoption of more complex technologies) could also increase credit intensity.

Change in funding structure: The low-interest-rate environment may have increased the attractiveness of debt finance relative to equity, leading to an increase in credit intensity. Debt-to-equity ratios of large companies in several Asian economies have, in fact, risen since the global financial crisis (Figure 1.3.2).

Outward credit leakage: The growing importance of regional and international firms within Asia, including in anticipation of the ASEAN Economic Community beginning at the end of 2015, could have led to an increase in the proportion of domestic borrowing by firms that is used to fund investment in other countries. In addition, Hong Kong SAR and Singapore, both financial centers, are hosts to a growing number of multinationals, and a rising share of credit issued in these financial centers is likely to be invested abroad.

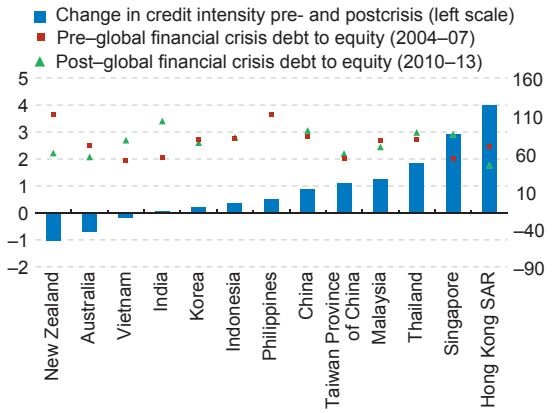
Increase in cash hoarding: Firms in the region have taken advantage of low interest rates and accommodative credit conditions to borrow in order to build cash buffers ahead of tighter conditions in the future. Relative to their total debt, nonfinancial corporations in China, Malaysia, and Singapore have increased their cash positions since the crisis, unlike those in countries where the credit intensity of GDP has declined (Figure 1.3.3).

The feasibility of maintaining an elevated credit intensity of GDP or raising it further has implications for whether credit can be a viable driver of future GDP growth. Put differently, is the marginal impact of credit on GDP subject to diminishing returns? The answer to this question likely depends on the specific factors underlying the increase in credit intensity. To the extent that it reflects cash hoarding or longer investment gestation periods, credit intensity can be expected to moderate in the future. However, to the extent that credit has fueled prices of real and financial assets to levels unsupported by fundamentals, output gains from further increases in credit may be small or even negative. This would be consistent with increased financial risk taking relative to economic risk taking. In addition, because rising credit intensity implies lower incremental output per unit of additional credit, the economy's capacity to service the increase in debt is diminished, thereby reducing credit's ability to support growth. Moreover, a rising credit intensity of GDP suggests that the effectiveness of the credit channel of monetary policy is weakened, eroding scope for monetary policy as a countercyclical tool.

Figure 1.3.2

Debt-to-Equity Ratio: Pre– and Post–Global Financial Crisis

(Precrisis and postcrisis average of market cap-weighted means, percent)

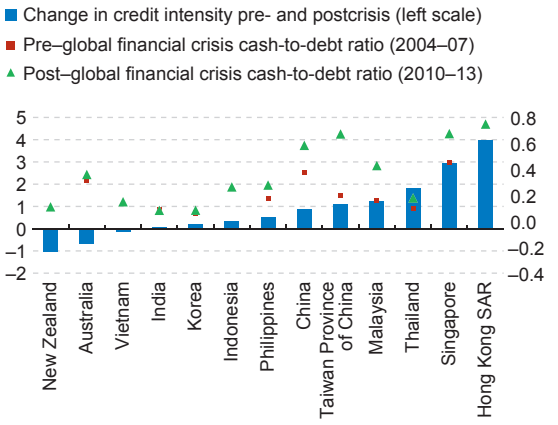


Sources: IMF, Corporate Vulnerability Utility; and IMF staff calculations.

Figure 1.3.3

Cash-to-Debt Ratio: Pre– and Post–Global Financial Crisis

(In simple ratios)



Sources: Bank for International Settlements; Haver Analytics; IMF, *International Financial Statistics;* IMF, World Economic Outlook database; Orbis; and IMF staff calculations.

Note: The cash-to-debt ratio is the average of the median for each country and year.

Box 1.4

Financial Conditions in Asia: How Accommodative Are They?

While market expectations about the path of the U.S. policy rate continue to point to a smooth exit scenario, central banks in Asia have taken different steps in their policy rate adjustment since the second half of 2014. Considering the accommodative stance and limited slack in a number of economies in the region, a few central banks have started raising policy interest rates (Malaysia, New Zealand, the Philippines). Meanwhile, with a relatively benign inflation outlook and slowing growth, other central banks in the region eased in 2014 (such as Korea and Thailand) and 2015 (Indonesia). When adjusting their policy rates, in addition to growth and inflation as in the case of flexible inflation targeters, central banks have generally mentioned financial conditions.

More generally, policy rate changes affect market rates and ultimately broader financial conditions. Since monetary transmission operates with long and varying time lags and monetary policy exerts influence over other asset prices, policy rates alone are not sufficient to measure broader financial conditions in the economy. For this reason, a financial condition index (FCI) that summarizes the impact of financial variables on current and prospective economic conditions can be useful. In addition to being an estimate of broad financial conditions in an economy, the FCI also provides an important input to monetary policy formulation.

More formally, the FCI is defined as a weighted average of relevant financial variables that have a sizable impact on aggregate demand conditions. The weights on each financial variable are generally assigned based on estimates of the relative impacts of changes in the variables on real GDP or other real activity indices. In practice, weights are usually estimated from reduced-form equations, vector autoregressive (VAR) models, or dynamic factor models. While a simple regression approach can take into account a direct relationship between financial variables and the target real variables (Guichard and Turner 2008; Rosenberg 2010), a dynamic factor model is more appropriate for integrating information from a large set of financial variables (Hatzius and others 2010; Matheson 2012). In any event, an FCI has to be used with caution, since the stability and predictive power are known to be questionable. This is particularly relevant for many Asian economies, in which financial markets are still growing rapidly and financial sector structures are changing.

Considering relatively scant research for Asian economies and their substantial heterogeneity, three approaches were considered when constructing FCIs for the research reported in this box: a simple average of standardized financial variables, a VAR-based FCI, and an FCI based on dynamic factor models. Estimations were carried out for each economy considered. Monthly data used in the estimates span the period 2000 to 2015. The simple average approach includes nine variables (signs in parentheses following the variables are imposed in the construction of the FCI based on the *presumed* impact of the variable in question on aggregate demand): real effective exchange rate (–), credit growth rate (+), spread between three-month and policy rate (–), money growth rate (+), stock return (+), net bond issuance (+), Chicago Board Options Exchange Volatility Index (VIX) (–), sovereign premium (–), and credit spread between the lending rate and bond rate (+). In the VAR approach, the variables included are real credit growth, real stock return, real lending rate, and real effective exchange rate (as endogenous variables) and U.S. GDP growth rate and VIX (as exogenous variables). Weights were assigned according to accumulated GDP growth rate response to a unit forecasting error of the corresponding variable under a generalized impulse response scheme (Pesaran and Shin 1998), which is robust to the ordering of the variables in the VAR. The dynamic factor model comprises 12–20 variables including spreads, prices, quantity variables, and loan officer surveys where available (Japan, Korea). The expectation-maximization algorithm of Stock and Watson (2002) is applied to unbalanced data.

The three estimations yield qualitatively similar results for most economies considered. To check the statistical adequacy of the estimated FCI and the empirical model, cross-correlations between GDP growth and FCI, GDP growth response functions to an FCI shock, and out-of-sample forecast errors of GDP growth rate were checked. In all cases, the estimated FCIs are found to be positively correlated with GDP growth, and the response of the GDP growth rate to a tightening of financial conditions is generally negative. However, in about a half of the cases considered, the inclusion of the FCI in a forecasting model for activity did not improve the forecasting

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Prepared mainly by Kum Hwa Oh and Roberto Guimarães.

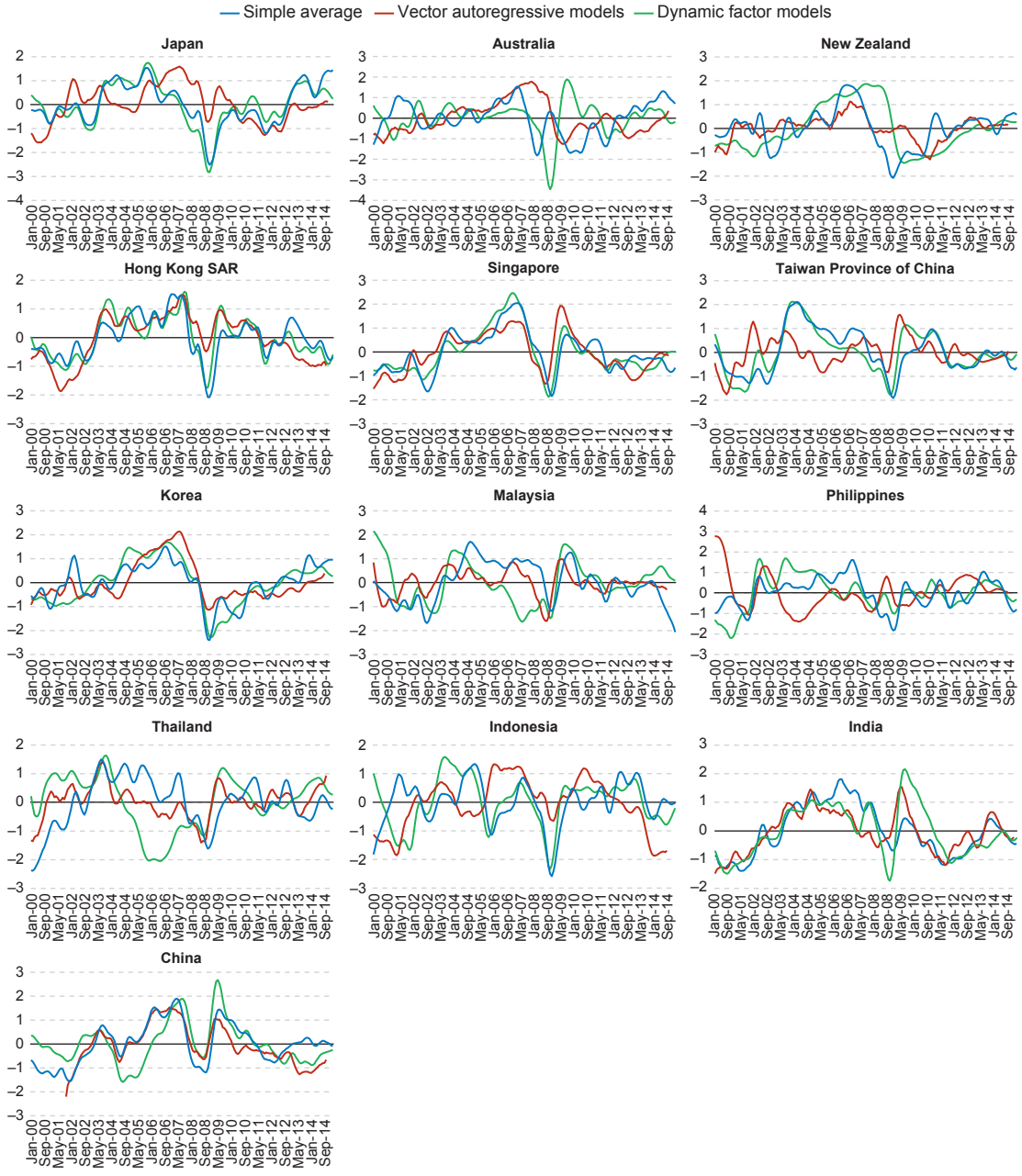
Box 1.4 *(continued)*

performance relative to a simple autoregressive model (for activity). While the relatively small amount of improvement in forecasting performance with FCI-augmented models might have been caused by highly volatile growth rates during the forecasting sample (first quarter of 2005 to the fourth quarter of 2014), the results indicate that FCIs are more useful as a way to characterize broad financial conditions than as a forecasting tool.

The results obtained here are broadly in line with narratives of changes in financial conditions for most economies in Asia (Figure 1.4.1).

Figure 1.4.1

Selected Asia: Financial Conditions Indexes



Source: IMF staff estimates.

(continued)

Box 1.4 *(continued)*

- For example, in most Asian economies, financial conditions were becoming more accommodative until the global financial crisis—as shown by a rise in the FCIs—followed by a sharp tightening during the global financial crisis as the cuts in policy rates and monetary easing were not sufficient to offset the spikes in spreads and longer-term rates and the deceleration in credit and issuance in some economies.
- However, there are some cross-sectional differences in timing and dynamics of FCI fluctuations. For instance, in Malaysia and Thailand, the FCI estimated by the dynamic factor model approach started to trend downward even before the global financial crisis as quantity variables (in particular, bank credit and net bond issuance) decelerated. After the crisis, FCIs in many economies, including China and India, rebounded strongly, reflecting the compression in interest rate spreads, while in Japan, Korea, and New Zealand, financial conditions improved more gradually.
- As of February 2015, despite being close to neutral in most Asian economies, FCIs have started to tighten. The main exceptions to this trend are Japan and Korea, where FCIs are still significantly accommodative. In the other Asian economies, general trends in recent financial conditions have been mixed, reflecting asynchronous movements in the underlying variables. In a few cases, including Hong Kong SAR and Taiwan Province of China, FCI tightening has mainly been influenced by the appreciation of the real effective exchange rates and the rise in sovereign bond spreads (U.S. long-term rates).

Box 1.5

Spillovers to Asian Countries from Surges in Global Financial Market Volatility

In the summer of 2013, indication from the Federal Reserve of plans to taper its securities-purchase program created a surge in global financial market volatility and resulted in adverse spillovers to emerging market economies. Countries that experienced rapid capital inflows and strong currency appreciation pressures during 2010–12 saw a sharp reversal in the 2013 episode of market volatility. The risk of excessive market volatility remains in 2015 if advanced economies' monetary policy tightening takes an uncertain turn or occurs at an accelerated pace, especially given the increased capital flows into emerging markets.

This box examines the international spillover effects of surges in global financial market volatility (including those triggered by monetary policy normalization in advanced economies) and their dependence on the depth of financial linkages between countries (that is, the size of their external balance sheets). This analysis is based on an extended version of the global vector autoregressive (GVAR) models of Cashin, Mohaddes, and Raissi (2012, 2014a, 2014b)[1] that includes both trade and financial weights[2] as well as an index of global financial market volatility (capturing pressures in banking, securities, and exchange markets).

Figure 1.5.1 shows that a one-unit shock to the financial stress index[3] translates into lower overall economic growth globally and creates disinflation pressures in most countries. In Asia, it generates an output loss of about 1¼ percentage points during the first year after the shock, operating through trade and financial linkages. The commodity price channel also leads to an adverse impact on economic activity in commodity exporters (as oil prices fall by about 20 percent), in which growth falls by about 1¼ percentage points after one year. A widening of the output gap and lower commodity prices are likely to moderate inflation slightly, by 25 basis points globally. Nevertheless, there are substantial heterogeneities across countries in their inflation responses. Equity prices are likely to fall by 10 percent to 20 percent, reflecting increased risk aversion, while the real exchange rate would depreciate by different degrees across countries. Moreover, in most countries, the term premium (long-term interest rate minus short-term interest rate) increases in response to a surge in global financial market volatility (apart from in Japan and Korea).

The key findings of the box can be summarized as follows:

- The research confirms Rey's (2013) view that there is a global financial cycle in capital flows and asset prices, as derived from our GVAR modeling framework.
- In the event of sudden shifts in markets' expectations about unconventional monetary policy unwinding, asset prices can overshoot on the downside. Additionally, normalization can be costly and may involve substantial spillovers to other countries operating through trade and financial linkages, global liquidity, and portfolio-rebalancing channels.
- There are differences across countries in their responses to a surge in global financial market volatility. These would reflect the scale of emerging markets' trade and financial exposure to advanced economies, their individual cyclical positions, and their internal and external imbalances.
- While strong fundamentals and sound policy frameworks are important, they cannot fully isolate countries from the effects of an increase in global financial market volatility. This argument is supported by the impulse responses in Figure 1.5.1, in which no country seems immune from the impact of a surge in market volatility.

Prepared by Mehdi Raissi and Paul Cashin.

[1] See Chudik and Pesaran (forthcoming) for a survey on theory and practice of GVAR modeling.

[2] The financial weights are constructed based on countries' bilateral stock of portfolio investment liability positions, covering both equity and debt, derived from the IMF's Coordinated Portfolio Investment Survey.

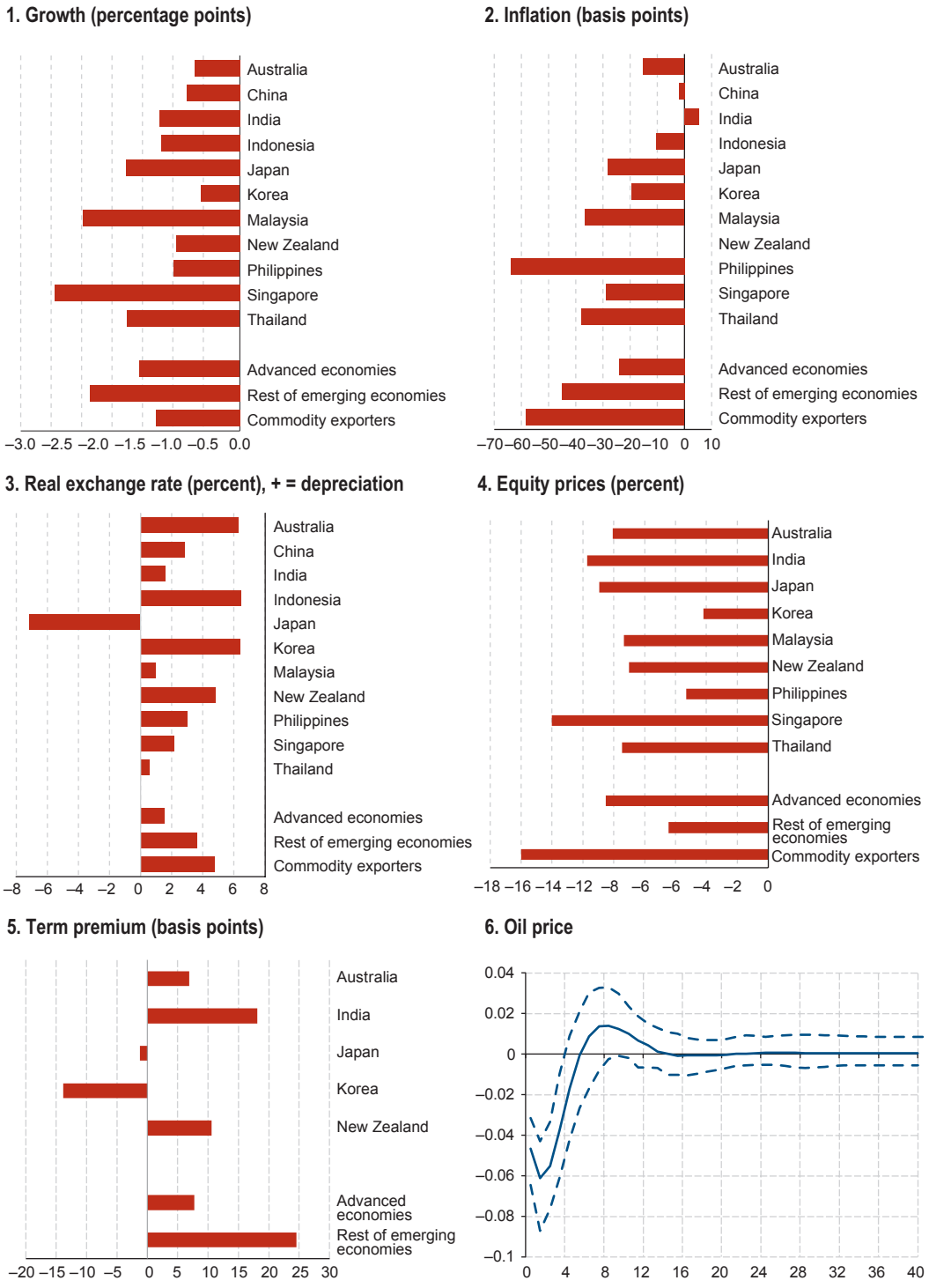
[3] A one-unit shock to the financial stress index is equivalent to one standard deviation. The magnitude of the shock is comparable to that of the 2002 episode of market volatility in advanced economies and much smaller than that associated with the global financial crisis.

(continued)

Box 1.5 *(continued)*

Figure 1.5.1

Responses of Key Variables to Global Financial Market Volatility Shocks



Source: Authors' estimates.

Note: Depicts change in macroeconomic/financial variables of a given country/region after one year associated with one positive shock to the financial stress index, implying an increase in global financial market volatility. Impulse responses for oil price (with 90 percent bootstrapped confidence intervals) are reported over a period of 40 quarters (vertical numbers should be multiplied by 100). The U.S. dollar is the numeraire.

Box 1.6

What's Going On in China's Housing Market?

China's residential real estate sector plays an important role in the economy and has been a key driver of growth. The housing market has softened visibly since 2014, reflecting oversupply in most cities, but how severe the adjustment will be and how long it will last are key questions. This box illustrates the extent of the oversupply problem, estimates a plausible adjustment scenario, and discusses implications for the economy.

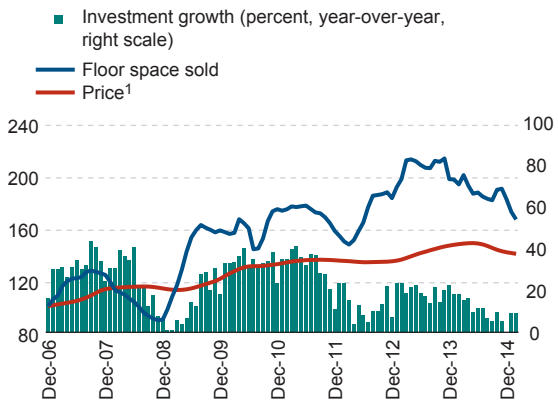
All indicators point to housing market weakness in China (Figure 1.6.1). Housing prices have been moderating both at the national level and across all city tiers, with the weakest performance among the smaller cities. Floor space sold, a good indicator of housing, has declined on a year-over-year basis since mid-2013. Toward the end of 2014, sales volume picked up slightly following the relaxation of home purchase restrictions and easing of mortgage financing conditions. On the supply side, floor space starts contracted by 14.4 percent in 2014, compared with 11.6 percent growth in 2013. This is mirrored by slowing growth in real estate fixed-asset investment, from about 20 percent in 2013 to 9.2 percent in 2014.

Housing inventory, measured by the ratio of floor space unsold to floor space sold, also shows a buildup since 2013 (Figure 1.6.2). According to National Bureau of Statistics data, the nationwide inventory ratio is only about four months, while data from local housing bureaus suggest that the nationwide ratio

Figure 1.6.1

Residential Real Estate: Market Conditions

(December 2006 = 100; seasonally adjusted; three-month moving average)

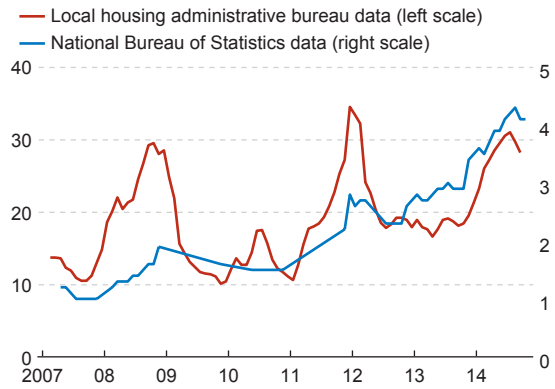


Sources: National Bureau of Statistics; and IMF staff calculations.
[1] National Bureau of Statistics 70-city newly constructed residential property average price.

Figure 1.6.2

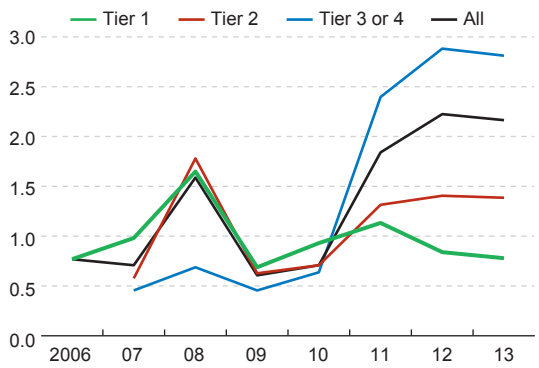
Residential Real Estate: Inventory Ratio

(Months; three-month moving average)



Residential Real Estate: Inventory Ratio by Tier

(Years)



Sources: Local Housing Administrative Bureau (*Fangguanju*); National Bureau of Statistics; and IMF staff calculations.
Note: The inventory ratio is measured as floor space unsold to sold.

Prepared by Mali Chivakul, Waikei Raphael Lam, Wojciech Stanislaw Maliszewski, Xiaoguang Liu, and Alfred Schipke.

(continued)

Box 1.6 *(continued)*

may be greater than two years.[1] While the inventory level from the two sources exhibits a large difference, the direction of the buildup is clear. Inventory is especially high in Tier 3 and Tier 4 cities.[2] While these inventory indicators suggest that oversupply could be a problem, they offer only a snapshot of the stock of unsold properties and the approximate time it would take to run down the inventory, given average annual sales. To better understand how the oversupply comes about and how the real estate market may return to equilibrium, this box analyzes China's housing demand and supply dynamics.

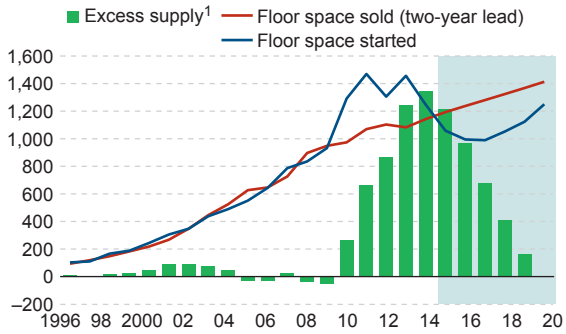
Excess supply, or "oversupply," is measured here as the cumulative gap between floor space starts and floor space sold (one to two years ahead). The latter is derived from National Bureau of Statistics data for historical values and from projections of floor space sold based on a real estate demand equation. The real estate demand regression is estimated using city-level data and indicates a long-term relationship between floor space per capita and fundamental determinants of demand, including household income per capita, residential property prices, urban population, nonagricultural population scale (population density), and city-tier dummies.

Floor space starts are used to approximate supply, as they have a strong correlation with real estate investment, a variable of ultimate interest (Figure 1.6.3). The gap is measured using floor space sold one to two years ahead, given that it usually takes one to two years after housing starts to have the resulting floor space ready for sale. The interpretation of the gap is straightforward: in equilibrium, developers should correctly anticipate demand conditions at the time when buildings will be ready for sale. Hence, the gap should be close to zero. If the developers overpredict, housing starts are above

Figure 1.6.3

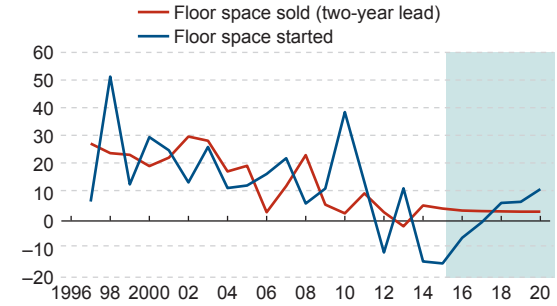
Residential Real Estate: Baseline Adjustment Scenario

(Millions of square meters)



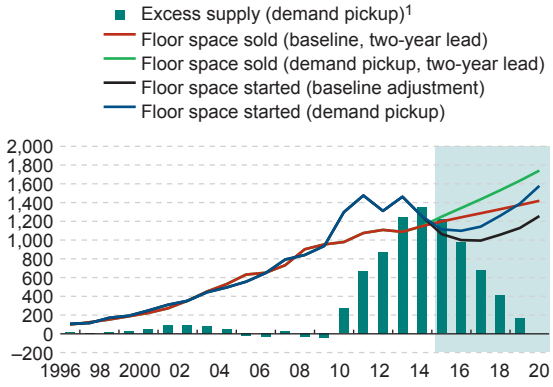
Baseline Adjustment Scenario: Growth Rate

(Percent; year over year)



Residential Real Estate: Stronger Demand Adjustment Scenario

(Millions of square meters)



Sources: National Bureau of Statistics; and IMF staff estimates and projections.

[1] Excess supply is measured as the difference between floor space started and sold (two-year lead).

[1] The differences may be attributable to different methodologies in data collection. The National Bureau of Statistics data rely on developers' self-reporting registration, which is subject to underreporting in unsold units and overreporting in sales, while data from local housing bureaus record all real estate registration, including buildings that have obtained permits to sell.

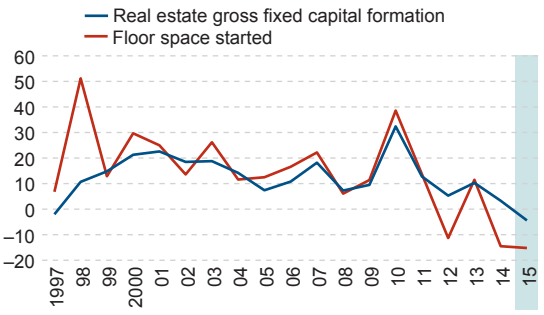
[2] Chinese cities are generally grouped into four categories: Tier 1 cities comprise Beijing, Shanghai, Guangzhou, and Shenzhen; there are 35 Tier 2 cities, mostly provincial capitals; other small and medium-sized cities are grouped into Tier 3 or Tier 4 cities.

Box 1.6 *(continued)*

the future demand (floor space sold one to two years ahead) and the gap is positive.

Adjustment scenarios are constructed by taking the floor space sold projections as given, which implies a continuation of the historical demand trend and assumes that floor space starts adjust such that oversupply gradually winds down. The baseline scenario assumes that the excess supply gap will close by 2020, broadly in a linear fashion (Figure 1.6.4). In this scenario, the excess supply will be absorbed through both a moderate contraction in floor space starts and a recovery of projected real estate demand over the medium term. A stronger pickup in demand could help marginally to narrow the excess supply gap, but it is unlikely to offset fully a potential contraction in floor space starts.

Figure 1.6.4
Residential Real Estate: Investment and Housing Starts
(Percent; year over year)



Sources: National Bureau of Statistics; and IMF staff calculations.

The adjustment scenarios show that growth in floor space starts would need to slow and contract in the near term. This will inevitably have an impact on growth given how important the real estate sector is to the Chinese economy (IMF 2014b). The relationship between growth in floor space starts and real estate gross fixed capital formation growth is estimated here, based on data from 2001–14.[3]

By applying the estimated coefficients and the oversupply indicators in various scenarios, it is estimated that real estate gross fixed capital formation could slow to –2 percent to –4 percent in 2015 from about 3 percent in 2014. As real estate gross fixed capital formation accounts for about 9 percent of GDP, this would imply a decline in GDP growth of about ½ percentage point in the baseline scenario. This excludes indirect effects arising from real estate linkages to upstream and downstream sectors. Some of these sectors suffer from an oversupply, and a slowdown in construction activity could bring losses, exposing vulnerabilities and posing risks (IMF 2014b).

Scenario analysis suggests that, without a policy response and unless demand picks up by more than expected, there is a high possibility of an imminent slowing of nationwide real estate investment, with a contraction likely in the near term. Slower real estate investment will have a sizable adverse impact on growth.

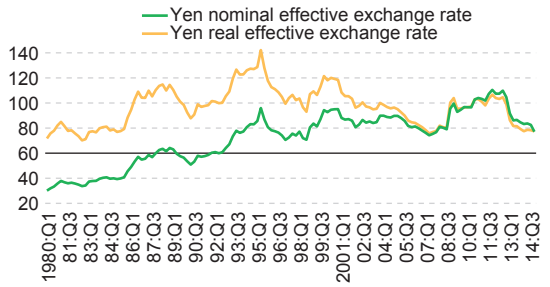
[3] The real estate gross fixed capital formation series estimated using the National Bureau of Statistics data is employed to keep the investment concept compatible with the national account (GDP) data. The real estate gross fixed capital formation series is estimated by taking the share of real estate investment in total fixed-asset investment (both series from the National Bureau of Statistics) and applying it to the measure of gross fixed capital formation in the national account.

Box 1.7

The Impact of Yen Depreciation on Japanese and Korean Exports: Is This Time Different?

Since the end of 2012, the Japanese yen has depreciated by a cumulative 40 percent against the dollar and 36 percent in nominal effective terms. Over the past two decades, Japan has experienced several episodes of large yen depreciation in which the drop in the nominal effective exchange rate exceeded 20 percent (Figure 1.7.1). However, the current depreciation episode is notable for its size and persistence, with the peak-to-trough change since the third quarter of 2009 exceeding 30 percent in real effective exchange rate terms. Moreover, following the announcement of enhanced qualitative and quantitative easing by the Bank of Japan in October 2014, the market has appeared to expect the weak yen to persist.

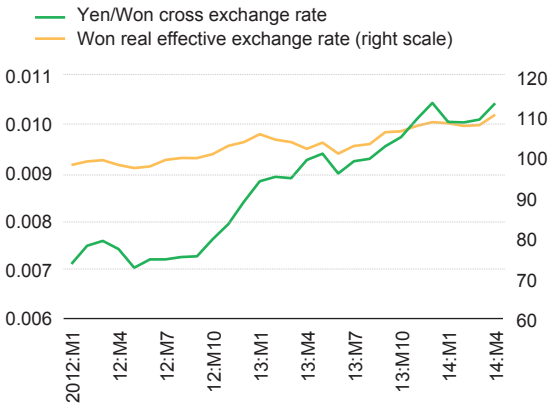
Figure 1.7.1
Yen Effective Exchange Rates Movement
(Index; 2010 = 100)



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

Real effective exchange rate movements can have spillovers to other countries, especially those that compete closely in the same markets. Among other Asian countries, Korea has the highest product similarity of exports with Japan, even within narrowly defined product groups (Deutsche Bank Market Research 2013). Moreover, since mid-2011, the Korean won to Japanese yen cross-rate has appreciated by 40 percent, and Korea's real effective exchange rate has strengthened by 15 percent (Figure 1.7.2).

Figure 1.7.2
Developments in Yen/Won Cross Exchange Rate and Won Real Effective Exchange Rate
(Index; 2010 = 100)



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

An interesting puzzle emerges from the current episode. Despite the strong and sustained real depreciation of the yen, a positive export response has been absent (at least until the fourth quarter of 2014), while Korea's export performance has held up well (Figure 1.7.3).[1] Although some delay is to be expected—consistent with the standard "J-curve" effect—this time the delay has been prolonged. This raises the question of whether real effective exchange rate changes are reflected in profit margins rather than in quantities or whether other phenomena have dampened the quantity response.[2]

Using data on four key export sectors (transportation, electronics, metals, and textiles), which account for about 40 percent of Japanese and Korean exports, this box explores the extent to which exporters react to real effective exchange rate movements through profit margin adjustment. When faced with a change in the exchange rate,

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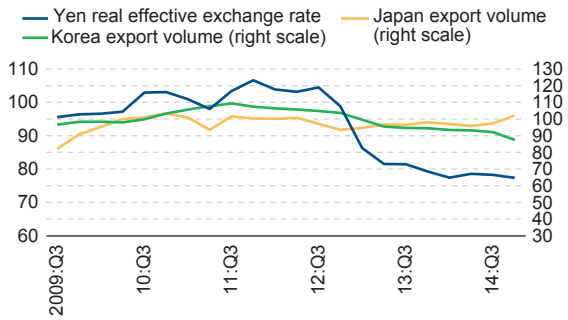
Prepared by Gee Hee Hong and Jack J. Ree.

[1] In the fourth quarter of 2014, Japanese export volume grew by 2.8 percent (quarter-over-quarter, seasonally adjusted).

[2] Weak global demand (see Box 1.1 on Asia's export slowdown) and Japan-specific factors, such as the increase in offshore production since the global financial crisis and a possible erosion of the former cachet of Japanese products, may also have contributed to the subdued performance of Japan's exports.

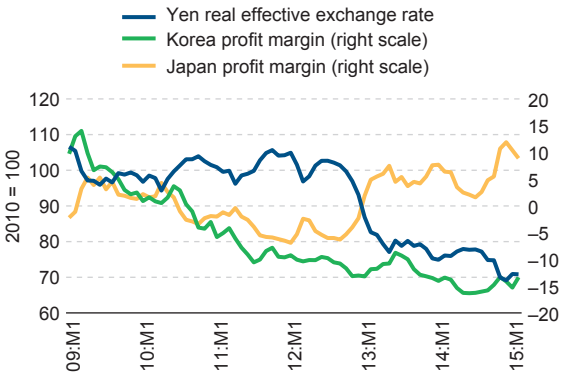
Box 1.7 *(continued)*

Figure 1.7.3
Japan and Korea Export Volume and Yen Real Effective Exchange Rate
(Index; 2010 = 100)



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

Figure 1.7.4
Relative Profit Margin Movements and Yen Real Effective Exchange Rate
(Index)



Sources: CEIC Data Co. Ltd.; and IMF staff calculations.
Note: Profit margin is defined as local-currency-denominated export price minus domestic price.

exporters must decide how much to pass through to the export price (which is likely to induce changes in quantities demanded) and how much to absorb into profit margins. If export prices in foreign-currency terms are left unchanged (consistent with pricing to market), then profit margins adjust in proportion to the exchange rate change. The strategy employed in this box is to (1) compare the short- and long-term price responses to real effective exchange rate changes in Japan and Korea for each sector and (2) assess whether firms' response to recent exchange rate shifts differs from that in previous episodes.

A sector's profit margin is defined here as the difference between domestic-currency-denominated export prices and the domestic producer price index for the same sector, following Marston (1990).[3] As such, the increase in Japan's profit margin during January 2013–October 2014, which first became evident when the real effective exchange rate depreciated strongly, contrasts with the reduced profit margins of Korean firms (although these have been on a sustained downward trend) (Figure 1.7.4).

The short- and long-term responses of profit margins to real effective exchange rate movements is estimated here by employing dynamic ordinary least squares and a vector error correction model, using data from the first quarter of 1980 to the fourth quarter of 2014 for Japan and the first quarter of 2000 to the fourth quarter of 2014 for Korea for each of the four key export sectors mentioned earlier. Variables included in the estimation are the real effective exchange rate, trading partners' demand, domestic production costs, and imported input costs. The findings are as follows:

- For both Japanese and Korean exporters, profit margins absorb part of the exchange rate movement, implying some pricing-to-market behavior (Figure 1.7.5).
- The long-term effect on profit margins is smaller than the short-term effect, but greater than zero. This implies that foreign-currency-denominated export prices tend to be relatively sticky in the short term and that pass-through of real effective exchange rate changes to export prices is greater over time, but less than 100 percent. For Japanese exporters, the full pass-through effect takes about 20 quarters. The results are broadly symmetric across appreciation and depreciation episodes.

[3] In Marston (1990), firms are assumed to serve the domestic and foreign market simultaneously and produce goods domestically. In accordance with profit maximization, firms set prices separately in the two markets based on individual demand elasticities, the exchange rate, and other factors. See Klitgaard (1999) for further details.

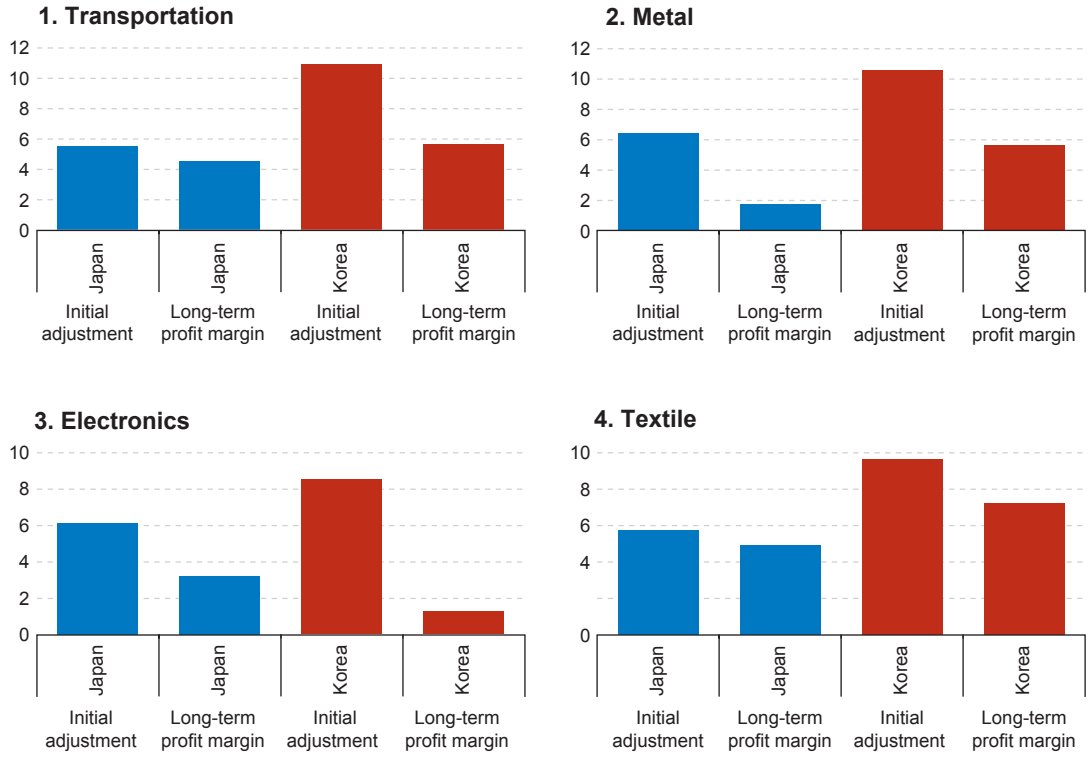
(continued)

Box 1.7 *(continued)*

Figure 1.7.5

Profit Margin Adjustment in Response to a 10 Percent Real Effective Exchange Rate Depreciation

(Percent)



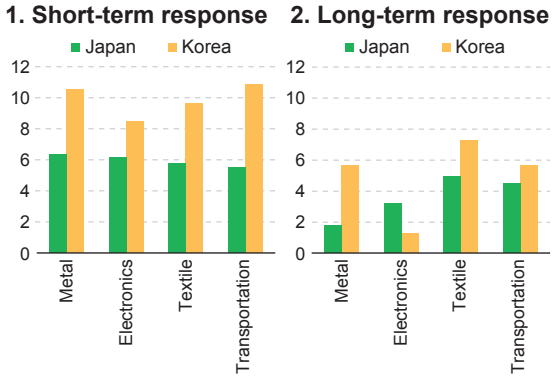
Sources: CEIC Data Co. Ltd.; and IMF staff estimates.

- Profit margins of Korean exporters tend to adjust by more than their Japanese counterparts, especially in the short term, implying greater expansion (compression) of short-term profits in the event of a real depreciation (appreciation) (Figure 1.7.6).
- The extent of real effective exchange rate pass-through to export prices varies by sector, especially in the long term, consistent with the extent of product differentiation and, hence, monopoly power of the exporter. For electronics, in which a substantial degree of product differentiation exists, long-term export price pass-through is higher than in the other sectors, in which products are more homogeneous (Figure 1.7.7).

Figure 1.7.6

Short- and Long-Term Responses to a 10 Percent Real Effective Exchange Rate Depreciation across Export Sectors

(Percent)



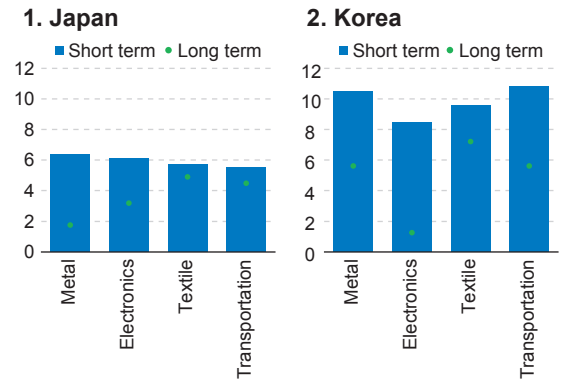
Sources: CEIC Data Co. Ltd.; and IMF staff estimates.

Box 1.7 *(continued)*

Figure 1.7.7

Japan versus Korea: Responses to a 10 Percent Real Effective Exchange Rate Depreciation

(Percent)



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

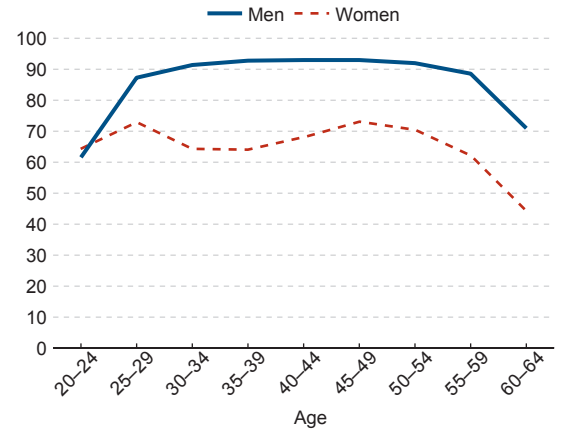
To address whether the response of profit margins to recent real effective exchange rate movements is different from that in previous episodes, an out-of-sample forecast is developed based on the model estimated using observations through the third quarter of 2012 (when the Japanese real effective exchange rate began to depreciate steeply). A comparison of the forecast with actual profit margins since the fourth quarter of 2012 reveals little evidence that the response of export prices to real effective exchange rate movements has recently changed. As predicted, profit margins in Japan widened, while they were squeezed in Korea. Because export prices were adjusted only marginally, export volumes did not respond to the large real effective exchange rate movements.

Box 1.8

Female Labor Force Participation in Japan: Is the Glass Half Full?

Raising women's labor participation has become an important pillar of the government's reform program in Japan. Faced with a rapidly aging population, greater inclusion of women in the workforce would help relieve labor supply constraints. Although female labor force participation in Japan has been rising, it still falls short of the average for advanced Organisation for Economic Co-operation and Development (OECD) economies, especially the Scandinavian economies. The wage gap between men and women in Japan is among the highest in the world, with wages for women about 25 percent lower. Japan lags behind in the World Economic Forum's overall gender gap score and ranks 105th out of 136 in its 2014 *Global Gender Gap Report* (World Economic Forum 2014).

Figure 1.8.1
Japan: Age–Employment Profile for Female Labor, 2012
(Percent)



Source: Kinoshita and Guo (2015).

More than half the female labor force in Japan occupies low-paid nonregular employment with a low chance of career progression. This is partly because women drop out of the labor force in their prime working age when they get married and have children (it is worth noting, however, that Japan's total fertility rate—at 1.4—is among the lowest in the OECD) and return to work after child rearing as nonregular employees. This tendency is reflected in the M-shaped employment pattern for women over the working life span (Figure 1.8.1).

Women occupy relatively few leadership positions in Japan. The proportion of female administrative and managerial workers is only 11 percent compared with 43 percent in the United States (Japan Cabinet Office, Gender Equality Bureau 2013). Also, women make up only 3.9 percent of board members of listed Japanese companies, versus 12 percent in the United States and 18 percent in France. It is not poor access to education that hinders women from reaching managerial positions, as the gap between men's and women's education attainment is very narrow. Rather, the main barriers to work for Japanese women are the lack of child care services, work-life balance, and flexible work hours.

What can be done to increase Japanese women's labor force participation, especially in regular employment? A recent study finds that child cash allowances and large persistent gender wage gaps deter women from pursuing regular employment (Kinoshita and Guo 2015). On the other hand, a higher total fertility rate is found to be associated with a greater proportion of regular female employment, in part because regular employment offers job security and full benefits during child rearing, making it easier to have children.

Attaining both higher female labor participation and higher birth rates is possible if the right conditions are in place, as shown by the Scandinavian countries (Figure 1.8.2). The Scandinavian countries too faced the demographic challenge of a shrinking population and low female labor participation in the 1970s. They have since implemented policies regarding benefits—available to both men and women—including comprehensive parental leave provision,

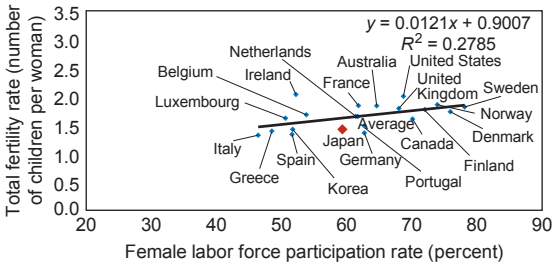
Prepared by Yuko Kinoshita.

Box 1.8 *(continued)*

access to child care facilities, and the statutory right to paid maternal and paternal leave. As a result, the gender gaps in both wage and labor force participation are among the smallest today. Japan can make this same transition, by providing affordable, flexible child care services and enacting parental benefit provisions. Public policies should be geared toward reducing the opportunity cost for women of working as a regular employee. In particular, the current system, which allows an income tax deduction for a spouse, creates a disincentive for female labor participation and should be replaced with a requirement for individual tax filing. Moreover, Japanese society and the economy would benefit from greater gender equality so that women can simultaneously maintain a career and a family.

Figure 1.8.2

Selected OECD Countries: Female Labor Force Participation and Total Fertility Rates, 1985–2012



Source: Organisation for Economic Co-operation and Development (OECD) Labor Force Survey.

Box 1.9

Cyclone Pam and Natural Disasters in the Pacific Island Countries

On March 13, 2015, Cyclone Pam, a devastating category-five storm, made a direct hit on Vanuatu. With wind speeds of up to 250 kilometers per hour, it was one of the strongest storms ever recorded in the Pacific region. All of the country's provinces were affected, including the capital city of Port Vila, where 90 percent of the housing stock was severely damaged or destroyed. Initial assessments indicated 11 confirmed fatalities, with several thousand people sheltering in evacuation centers and about half of the Vanuatu population of roughly 270,000 affected, including nearly 60,000 children.[1] Extensive damage to roads and bridges as well as substantial loss of crops and livestock were reported. With food and water supply compromised, the spread of disease is feared. Cyclone Pam also affected other Pacific island countries, including Kiribati, Solomon Islands, and Tuvalu, albeit to a much lesser extent.

The international humanitarian response has been rapid. Numerous aid workers have been deployed, and critical supplies were airlifted at first, followed by cargo ships. Assistance pledges from bilateral and multilateral development partners topped US$20 million in the first week after the disaster. In addition, Vanuatu is expected to qualify for a payout of up to US$6 million under the Pacific Catastrophe Risk Insurance Pilot for the Pacific Islands.[2] Vanuatu would also be eligible for the IMF's Emergency Assistance (discussed later).

Even before Cyclone Pam, Vanuatu was ranked as the most exposed country to natural disasters.[3] A year ago, Cyclone Lusi ripped through Vanuatu, taking 12 lives. Sixty-four percent of Vanuatu's citizens are believed to be exposed to natural hazards every year. These include earthquakes, volcanic eruptions, tsunamis, flooding, and tropical cyclones (Table 1.9.1). The average annual losses due to natural disasters in Vanuatu are estimated at 6–7 percent of GDP, the highest ratio among the Pacific island countries (Figure 1.9.1). Though the full extent of the damage has yet to be assessed, it appears that the catastrophe caused by Cyclone Pam will far exceed any past event in the country's history.

Table 1.9.1 Natural Disasters in Vanuatu and Their Impact, 1980–2014

Disaster type	Event count	Total deaths	Total affected (approximately)	Total damage ($US millions)
Storm—tropical cyclone	16	79	290,000	205
Earthquake	8	12	15,000	n.a.
Volcano	5	0	19,000	n.a.
Flood	2	0	4,000	n.a.
Storm—Other	1	32	n.a.	n.a.
Tsunami	1	100	n.a.	n.a.
Landslide	1	1	3,000	n.a.
Average per year	***1***	***6***	***9,500***	***> 5.9***

Source: Center for Research on Epidemiology for Disasters, International Disaster database.

Prepared by Nasha Ananchotikul, Vladimir Klyuev, and Yiqun Wu.

[1] Sources: United Nations Office for the Coordination of Humanitarian Affairs, the United Nations Children's Fund, and Oxfam International, as of March 18, 2005.

[2] The Pacific Catastrophe Risk Insurance Pilot is a joint initiative between the Secretariat of the Pacific Community, the World Bank, and the Asian Development Bank, with financial support from the Government of Japan and the Global Facility for Disaster Reduction and Recovery. The pilot covers Cook Islands, Marshall Islands, Samoa, Solomon Islands, Tonga, and Vanuatu.

[3] According to the World Risk Index, which measures exposure to natural hazards and the capacity to cope with and adapt to these events (United Nations University's Institute for Environment and Human Security 2011).

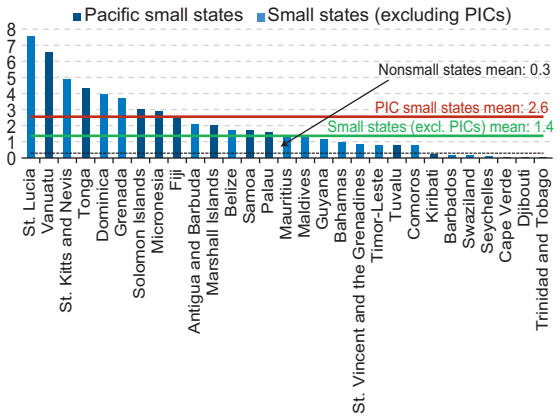
Box 1.9 *(continued)*

Cyclone Pam is a powerful reminder that the Pacific island countries are among those most vulnerable to natural disasters, including those related to climate change. The combination of their location and their small size heightens their susceptibility to earthquakes and weather-related extreme events. With intensified global warming and climate change, natural disasters appear to have increased in frequency and intensity in Asia and Pacific small states in recent decades (Figure 1.9.2).

Natural disasters pose severe macrocritical challenges for small states. Apart from their devastating humanitarian cost, natural disasters destroy or damage infrastructure and other capital and give rise to considerable macroeconomic volatility. IMF staff analysis for small Pacific states[4] covering 1970 to 2013 suggests that natural disasters reduce medium-term growth and worsen these states' underlying fiscal positions (Cabezon and others, forthcoming). The macroeconomic effects of a natural disaster with an intensity equivalent to fatalities among 1 percent of the population[5] are shown in the impulse responses plotted in Figure 1.9.3. After such a shock, growth declines by 0.7 percentage point on average in the first year. Although output starts to recover in the following year, the response implies a permanent loss in the level of income. In addition, the fiscal balance deteriorates by a cumulative 0.5 percentage point of GDP within the first two years of the shock.

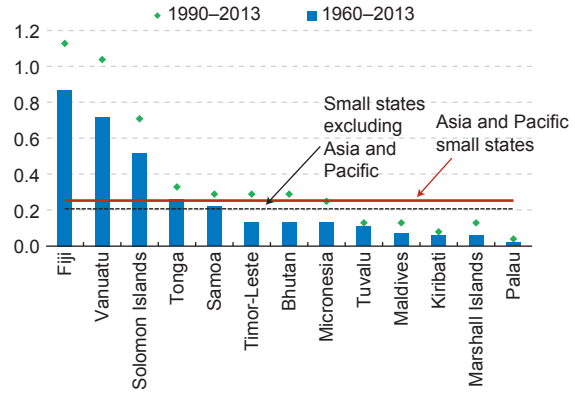
Policy responses to the threat of natural disasters need to be multidimensional and multilateral. Natural disaster risks should be integrated into macroeconomic frameworks to ensure adequate financial buffers are available, including those in the form of disaster insurance coverage. To the extent possible, disaster-preparedness measures should be taken, which will require making room for them in the budget.[6]

Figure 1.9.1
Annual Average Damage
(Percent)



Sources: Center for Research on Epidemiology of Disasters, International Disaster Database; Pacific Catastrophic Risk Asessment and Financing Initiative; and IMF staff estimates.
Note: Based on the period 1970–2013. PICs = Pacific island countries.

Figure 1.9.2
Asia and Pacific Small States: Occurrence of Disasters per Year
(Average number of disasters per year)



Sources: Center for Research on Epidemiology for Disasters, International Disaster database; and IMF staff estimates.

[4] Including Fiji, Samoa, Solomon Islands, Tonga, and Vanuatu.

[5] Intensity is calculated according to the standard formula $Intensity = 100 \times \left(\frac{fatalities + 0.3 \times total\ affected}{population} \right)$.

[6] Disaster preparedness takes a number of forms, including information dissemination, stockpiling emergency supplies, establishing emergency procedures, and fortifying buildings and infrastructure. In Vanuatu, early warnings and emergency training have been credited with limiting the loss of life from Cyclone Pam. However, the housing stock could not withstand the force of the cyclone.

(continued)

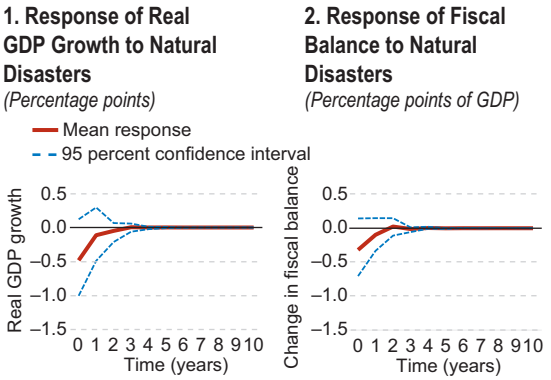
Box 1.9 *(continued)*

Self-insurance should continue to play a crucial role in risk management, consistent with a necessary level of independence and ownership of the policy response. Sufficient policy space (adequate international reserves, low external debt, and contingency funds) and outside insurance will help mitigate potential balance of payments shortfalls. Still, the economic effects of natural disasters will be difficult for small states to manage on their own. Moreover, small states can do little to address the root causes of natural disasters, as they are on the receiving end of spillovers from climate change. Therefore, external assistance is expected to continue to play a vital role in any response to natural disasters affecting small states.

The IMF's engagement in regard to natural disasters includes macroeconomic surveillance, lending under IMF-supported programs, and capacity development.

Figure 1.9.3

Pacific Island Countries: Response to a Natural Disaster



Source: IMF staff estimates.
Note: Response to a natural disaster with intensity equivalent to fatalities occurring among 1 percent of the population.

- *Surveillance.* In the context of surveillance, the IMF can help members develop a multipillar strategy for dealing with natural disasters. The strategy includes enhancing resilience by building buffers, participation in sovereign insurance mechanisms, and having reliable access to prompt financing on terms consistent with stability considerations. These approaches reduce the need for policy adjustments after a shock.
- *IMF facilities.* The IMF offers financing to meet a broad range of urgent balance of payments needs, including those arising from natural disasters. This assistance can be accessed through the Rapid Financing Instrument, which is available to all member countries, and the Rapid Credit Facility, which provides rapid financing with limited conditionality and on concessional terms to low-income countries. Both lending facilities are designed for members that do not require a full-fledged economic program or for which such a program is not feasible because the need is urgent or policy implementation capacity is limited. After Samoa was hit by Tropical Cyclone Evan in December 2012, suffering loss of life and damage estimated at 30 percent of GDP, a request for a one-off disbursement of US$8.6 million under the Rapid Credit Facility was approved in May 2013. The IMF's Extended Credit Facility arrangement with Solomon Islands catalyzed donor support after the floods in April 2014.
- *Capacity development.* IMF policy advice on coping with natural disasters is also supported by capacity development and training. For example, capacity development in the area of public financial management can help improve the platform from which Pacific island countries seek assistance for coping with natural disasters and climate change. The IMF also provides technical assistance to all members interested in environmental tax reforms to make sure that energy prices reflect the harmful environmental side effects associated with energy use.

Box 1.10

House Price Dynamics in Asia: A New Vulnerability?

Declines in house prices could pose a near-term risk to a number of economies in Asia. In addition, the buildup of household debt in a number of these economies could amplify the effect of house price shocks on economic activity. Even leaving aside severe housing downturns, price changes have affected business cycle fluctuations through both the level of residential investment and private consumption (through wealth and "sentiment" effects).

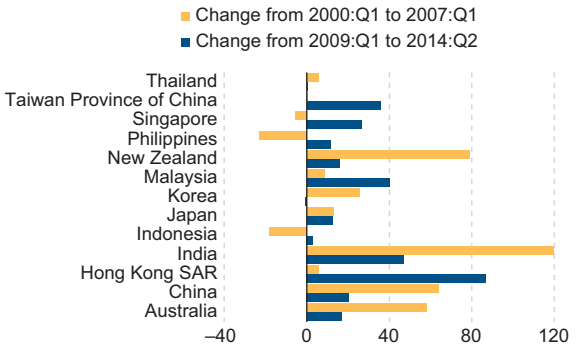
Given the potential importance of housing cycles in Asia, this box examines the drivers of house prices as well as the impact of house price fluctuations on economic activity. While estimating the effect of house prices on activity is difficult, the analysis presented here suggests that the housing cycle is an important determinant of the economic cycle. Standard vector autoregressions (VARs) indicate that house price shocks have a sizable impact on activity; the effects appear to be larger once the feedback effect of credit on activity and house prices is incorporated into the empirical model. In addition, interest rate shocks have a significant effect on house prices, suggesting a stabilizing role for monetary policy.

House prices have risen rapidly across most of Asia since 2007, in excess of 50 percent in many economies (Figure 1.10.1). This appears to have happened too rapidly in some cases, in that it has led to large increases in price-to-rent ratios in a number of economies. With the notable exception of Australia and New Zealand, house price dynamics in Asia and Pacific have been distinct from those of the United States and other advanced economies, and house prices in Asia did not fall during the global financial crisis. Before the recent moderation in housing investment, China had experienced strong house price gains in some of the larger urban areas.

Figure 1.10.1

Real House Price

(Percentage)



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

Drivers of house prices and effects of house price shocks

Given that rapidly rising household credit has often been associated with the upward cycle in house prices, a deceleration in credit growth could trigger house price declines. Even without such triggers, house prices could fall where price levels currently show signs of overvaluation. The drop in house prices (or the deceleration in the increase momentum), in turn, would lower the value of collateral in the economy, amplifying the impact of the original shock on consumption and investment. This effect could trigger an adverse feedback loop between house price declines and aggregate demand. A reverse feedback loop plays out in the upswing phase of the cycle, as financial constraints are relaxed as collateral values rise, generating positive comovements between house price appreciation and aggregate demand. Indeed, strong private consumption growth in the region has been associated with rising house prices in a cross-section of Asian economies during 2009–14 (Figure 1.10.2), a fact also consistent with the temporal correlations discussed above.

To gauge the effect of interest rates and credit on house prices, as well as the effect of house prices on activity, two VAR types are estimated. First, individual-country VARs are estimated on a sample of selected Asian

Prepared by Roberto Guimarães.

(continued)

Box 1.10 *(continued)*

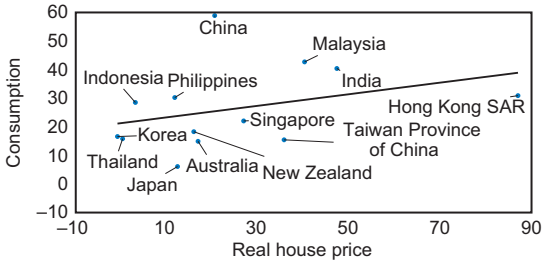
emerging market economies (covering 1995–2014, in the second quarter in most cases). The second set of estimates is based on a panel VAR estimated for the same set of economies.

Following Igan and Loungani (2012), a VAR is applied to individual-country data. The VAR model here is more parsimonious given data constraints and includes the log levels of GDP, the consumer price index, a house price index, a short-term interest rate (in levels), and the nominal effective exchange rate. The shocks are identified recursively by applying the ordering just outlined. For robustness, where degrees of freedom could be kept to a reasonable level, the models are also estimated with the U.S. GDP and a commodity price index (or U.S. short-term interest rate) as exogenous variables. The results for the individual-country VARs are robust to whether generalized responses are used. In the case of the panel VAR, country fixed effects are included, and homogeneous coefficients are imposed on the other parts of the VAR. The panel VAR is estimated by Global Markets Monitor, and shocks are identified recursively as in the case of the individual VARs.

Figure 1.10.2

Real House Price and Real Consumption Growth

(Percent; change from 2009:Q1 to 2014:Q2)

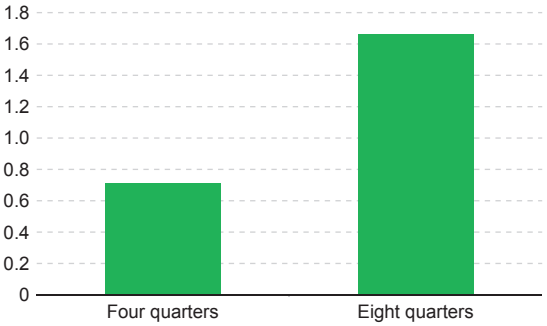


Sources: CEIC Data Co. Ltd.; Haver Analytics; and IMF staff calculations.

Figure 1.10.3

Impact of Real House Price Shock on Real GDP

(Percent; one standard deviation shock in real housing price = 3.3 percent)



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

The estimates suggest that house price declines, if sustained, could have large effects on economic activity in a number of Asian emerging market economies. A 5 percent decline in the house price index could lower GDP (relative to the baseline) by an average of 1.3 percent in these economies after one year.[1] A 5 percent drop in house prices would be broadly in line with the median decline observed during housing market busts during 1995–2013 (see Box 2.1 in the April 2014 *Regional Economic Outlook: Asia and Pacific*). The results are generally robust, and the panel VAR estimate yields an impact of 1.1 percent, very close to the average effect estimated with the individual-country VARs (Figure 1.10.3). Finally, the effect on activity is larger at longer horizons (though subject to considerable uncertainty) if real credit is included in the empirical model, suggesting that credit may amplify the impact of house price shocks on economic activity (the accelerator effect).

The effect of interest rates on house prices is also statistically significant after four and eight quarters. For instance, a one standard deviation (165 basis point) increase in interest rates (slightly higher than the increase in the U.S. 10-year rate during May–September 2013) could lower house prices in Asian emerging

[1] This is based on the average of individual-country VARs and masks considerable heterogeneity in the estimated effect of house price shocks on GDP. For instance, for China the effect is about half of the reported average and is subject to much more uncertainty (partly because of the shorter sample).

Box 1.10 *(continued)*

market economies by about 1.2 percentage points after one year (Figure 1.10.4). This suggests that, if the effect of higher global interest rates is transmitted to domestic interest rates, house prices in the region will most likely be affected, with an impact on consumption and investment.

Figure 1.10.4

Impact of Interest Rate Shock on Real House Price

(Percent; one standard deviation shock in interest rate = 165 basis points)

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

Box 1.11

Financial Spillovers in Asia: Evidence from Equity Markets

Financial integration in Asia, while not as strong as trade integration, has been on the rise (see Chapter 3). Moreover, because China's economy is large, developments in its financial markets have and will become increasingly more important for the rest of the region, replicating what has happened in trade. With the increased correlation between equity markets and the greater emphasis on intraregional financial integration initiatives in Asia, it is important to understand how the interdependence of financial markets across Asian economies has evolved. Understanding the propagation of shocks is also important to gauging the *direction* of spillovers, that is, from where the shocks a country receives come and to where the shocks a country sends out go, and on net, whether a country is a net recipient or giver of spillovers.

This box uses a spillover index developed by Diebold and Yilmaz (2009, 2012) to analyze the interdependence of asset returns and volatilities in 20 economies, including 13 Asian economies.[1] The index measures quantification of the contribution of shocks from one country's asset returns and volatilities to another's at different points in time. Two sets of vector autoregressions are estimated: one including equity returns and another with the realized volatility of equity returns. The time-varying spillover index is obtained as the generalized impulse responses, which are derived using four lags in the vector autoregression estimation and a 10-week rolling window. Because the generalized impulse response functions and variance decompositions are invariant to the ordering of the variables, two separate (gross) directional spillovers can be defined: (1) gross shocks transmitted by one country to all other countries (outward spillovers) and (2) gross shocks a country receives from all others (inward spillovers). The difference between (1) and (2) can be used to define net spillovers. For instance, in the sample examined here, this approach permits measurement of how much of Malaysia's asset returns are explained by the shocks originating from the rest of the world in total, as well as from a specific economy such as China, and vice versa. This feature of the spillover indices considered here complements standard analyses of the impact of financial shocks on real and financial variables. Finally, using rolling-windows estimation, one can also capture the time-varying intensity of spillovers and the behavior of spillovers during crisis and noncrisis periods. The baseline results are obtained from a 200-week window, but the results are robust to different lags (8 months), forecasting horizons (15 and 20 weeks), and windows (100 weeks).

The estimation results suggest that financial spillovers to and from Asia as well as intra-Asia spillovers are sizable. Against this backdrop, are spillovers on the rise in the region as global and regional financial market integration continues? What has happened since the global financial crisis? The main results are as follows:

- Equity return and volatility spillovers have increased substantially since the global financial crisis, with a mild decrease in recent years, as shown in Figure 1.11.1. The increase in spillovers has been widespread, with both advanced and emerging market economies experiencing greater *to* and *from* spillovers.
- The net spillovers of both return and volatilities exhibit a distinct difference between advanced economies and emerging markets since the global financial crisis: advanced economies are turning from net givers of shocks to net receivers, while emerging markets, particularly in the ASEAN-5 (Indonesia, Malaysia, Philippines,

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Prepared by Roberto Guimarães and Gee Hee Hong.

[1] The main underlying data are daily nominal local-currency stock market indices from January 1996 to January 2014, taken from Haver Analytics. The sample includes 13 Asian and Pacific economies (Australia, China, Hong Kong SAR, India, Indonesia, Japan, Korea, Malaysia, New Zealand, the Philippines, Singapore, Taiwan Province of China, Thailand), 4 advanced economies (France, Germany, United Kingdom, United States), and 3 emerging markets from other regions (Brazil, Mexico, Turkey). Additional estimates were also conducted, including for the euro area and South Africa (and excluding France and Germany), from June 24, 2002 (South Africa data available after this date).

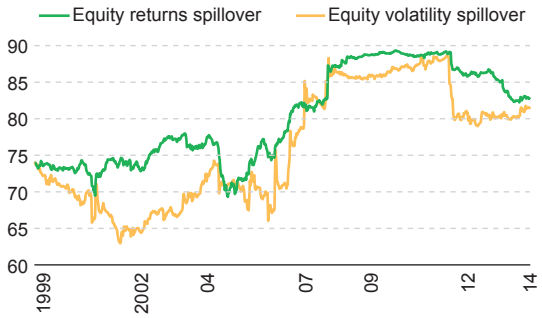
Box 1.11 *(continued)*

Singapore, Thailand, China, Korea) are increasingly becoming net givers (see Figure 1.11.2 for a selection of countries).

- The decrease in net spillovers for advanced economies since the global financial crisis has been driven by both the decline in the contribution to and from other countries. Meanwhile, the rise in net spillovers in emerging markets since the crisis has been driven by the increase in the contribution to other economies, suggesting that fluctuations in emerging markets' equity prices (and activity more generally) have been exerting more influence over global markets.
- The increase in net return and volatility spillovers in most Asian emerging market economies may be partly due to growing regional financial integration. This has deepened since the global financial crisis, as foreign banking claims of euro area banks in the emerging and developing Asia and Pacific region have declined since 2008 and have been replaced by the expansion of Japanese and Chinese banks (see the April 2015 *Global Financial Stability Report*). But Hong Kong SAR and Japan have become net receivers.

Figure 1.11.1

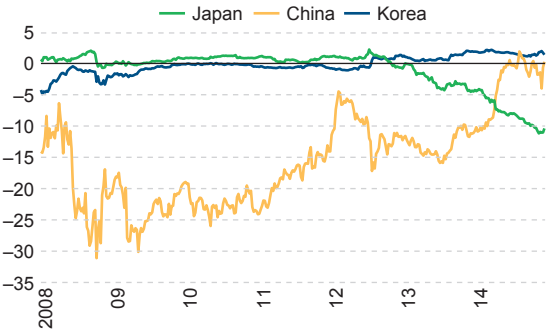
Spillover Plot, Equity Market Returns, and Volatility



Sources: Haver Analytics; and IMF staff calculations.

Figure 1.11.2

Net Asset Returns Spillover



Sources: Haver Analytics; and IMF staff calculations.

The growing importance of China in regional financial market dynamics can also be seen from the changing pattern of spillovers, since China has increasingly become a net giver of financial shocks to the rest of the Asia and Pacific region. This stands in contrast to the role of Japan, which is turning into a net recipient of spillovers. The rise in intraregional spillovers among emerging market economies also confirms their roles as net source(s) of shocks, which is expected to grow, especially as trade and financial integration continue to strengthen.

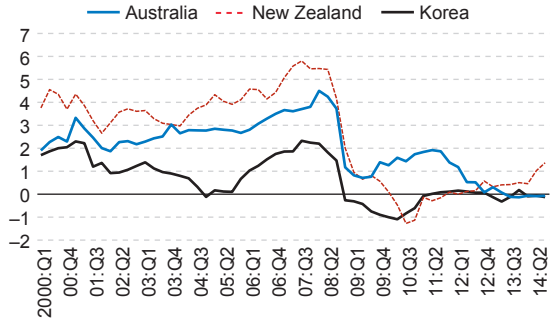
Box 1.12

Has the Neutral Rate Fallen in Asia?

Real interest rates have dropped sharply in many Asian economies since the global financial crisis as a result of substantial cuts in nominal policy interest rates (Figures 1.12.1 and 1.12.2). However, the sustained postcrisis subpar growth could suggest that the degree of policy stimulus is not as strong as indicated by lower real rates, hinting at a decline in the neutral real interest rate. This box estimates the neutral rate for nine Asian economies using a range of methods. The analysis suggests that neutral rates have fallen in many Asian economies because of lower trend growth at home and a lower global neutral interest rate. While considerable uncertainty surrounds the level of the neutral rate, the estimated trend decline nonetheless suggests that—all else being equal—real policy rates should eventually normalize to a level somewhat lower than the precrisis level.

Figure 1.12.1

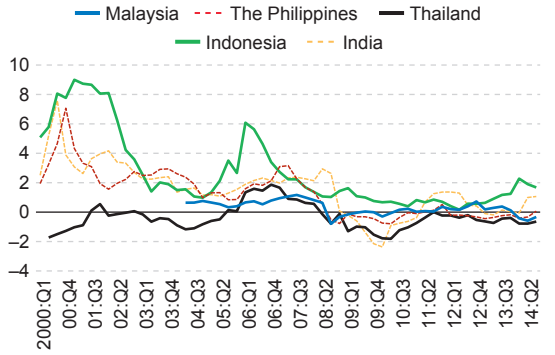
Real Interest Rates



Sources: Bloomberg, L.P.; CEIC Data Co. Ltd.; Haver Analytics; and IMF staff calculations.

Figure 1.12.2

Real Interest Rates



Sources: Bloomberg, L.P.; CEIC Data Co. Ltd.; Haver Analytics; and IMF staff calculations.

The neutral rate is defined as the interest rate consistent with output at its potential level and inflation at the central bank's target. It provides an anchor for monetary policymaking and corresponds to the intercept term in the Taylor rule. In this light, the actual real rate will fall below the neutral rate when cyclical conditions suggest excess capacity, and vice versa.

Three methods are applied to estimate the time-varying neutral real interest rate. The first method relies on a calibrated Euler equation (which is a key component of dynamic stochastic general equilibrium models and asset-pricing models), in which the neutral rate is derived from the household's optimal consumption decision. As shown in equation (1.12.1), the equilibrium rate r^* depends on the household's discount factor β, consumer's degree of risk aversion γ, the degree of habit persistence θ (which is an additional term compared with standard specifications), and expected consumption growth g:

$$r^* = -\ln\beta + \gamma g - \tfrac{1}{2}\gamma(1-\theta). \qquad (1.12.1)$$

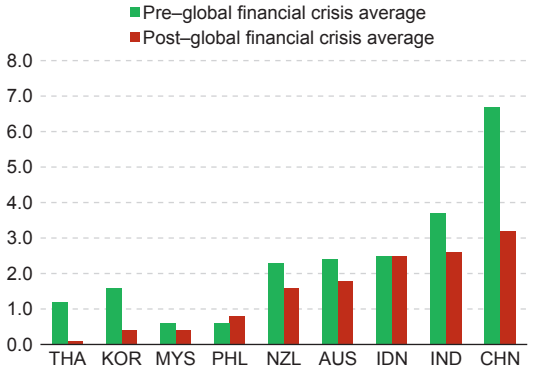
This equation states that the neutral real rate will be higher if expected consumption growth is high. As households smooth their consumption over time, expected higher future income will lead to more consumption today; therefore

Prepared by Longmei Zhang and Kum Hwa Oh.

Box 1.12 *(continued)*

a higher interest rate is needed to encourage households to postpone consumption. The calibration[1] shows that the neutral rate has declined significantly in Australia, China, India, Korea, New Zealand, and Thailand, reflecting the moderation in trend growth, but remained broadly stable in Indonesia, Malaysia, and the Philippines. The calibrated neutral rate, however, is generally higher than the average real rate observed in emerging Asia, especially in China and India, which could reflect factors such as financial repression or model misspecification (Figure 1.12.3).[2]

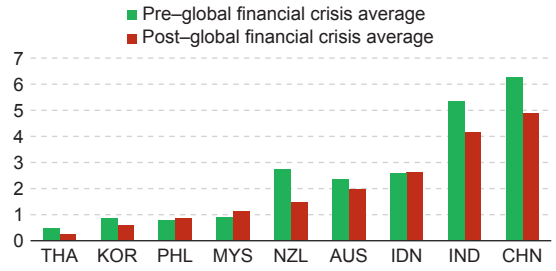
Figure 1.12.3
Real Neutral Rate: Theoretical Calibration



Source: IMF staff estimates.
Note: AUS = Australia; CHN = China; IDN = Indonesia; IND = India; KOR = Korea; MYS = Malaysia; NZL = New Zealand; PHL = the Philippines; THA = Thailand. The pre–global financial crisis average refers to 2001–08. The post–global financial crisis period refers to 2009–14.

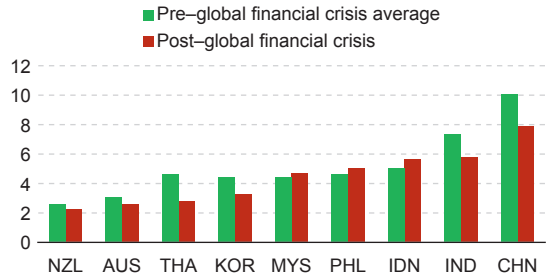
The second method employs a semistructural model developed by Laubach and Williams (2003), in which the neutral rate is jointly estimated along with trend growth and the output gap. The model consists of three structural equations. The first is the IS curve, which relates the output gap to its own lag and the interest rate gap (defined as the difference between the actual real rate and the neutral rate). The second is the Phillips curve, in which inflation depends on lagged inflation and the output gap. And the third specifies that the neutral rate depends on trend growth, consistent with the steady state in standard growth models. The model estimates show that, consistent with the lower trend growth rate, the neutral rate has dropped by 0.5–2 percentage points in most Asian economies, except for Indonesia, Malaysia and the Philippines, where estimated trend growth has been stable (Figure 1.12.4 and Figure 1.12.5).

Figure 1.12.4
Real Neutral Rate: Semistructural Model Estimates



Source: IMF staff estimates.
Note: AUS = Australia; CHN = China; IDN = Indonesia; IND = India; KOR = Korea; MYS = Malaysia; NZL = New Zealand; PHL = the Philippines; THA = Thailand. The pre–global financial crisis average refers to 2001:Q1–08:Q3. The post–global financial crisis period refers to 2008:Q4–14:Q4.

Figure 1.12.5
Trend Growth Rate: Semistructural Model Estimates



Source: IMF staff estimates.
Note: AUS = Australia; CHN = China; IDN = Indonesia; IND = India; KOR = Korea; MYS = Malaysia; NZL = New Zealand; PHL = the Philippines; THA = Thailand. The pre–global financial crisis average refers to 2001:Q1–08:Q3. The post–global financial crisis period refers to 2008:Q4–14:Q4.

[1] The model is calibrated using standard values from the macrofinance literature, while allowing for cross-country differences to align the calibrated rate with actual observed interest rates. The calibrated parameters are as follows: $\beta = 0.99$, $\gamma = 1$, and $\theta = 0.995$ for Australia and New Zealand, 0.89 for China, 0.94 for India, and 0.93 for Korea and ASEAN countries. Trend growth of real GDP per capita is used as a proxy for g.
[2] There is a general tendency for these models to predict a higher risk-free rate.

(continued)

Box 1.12 *(continued)*

The previous two methods have focused on the role of domestic growth on the neutral rate. While domestic growth plays a dominant role in large and financially less open economies, such as China and India, the global interest rate may also have an important effect on domestic interest rates in smaller open economies that are well integrated with world financial markets. To empirically assess the importance of the global interest rate in the determination of the domestic neutral rate, the third estimation methodology extends the Taylor rule setting to study the time variation of the neutral rate. In a standard Taylor rule, as shown in equation (1.12.2), the policy rate r reacts to output gap y and inflation π, while assuming that the real neutral rate r^* is a constant. In the extended Taylor rule setting, the neutral rate is allowed to be time varying, and its own dynamic depends on noncyclical global factors and country fundamentals, as captured in equation (1.12.3):[3]

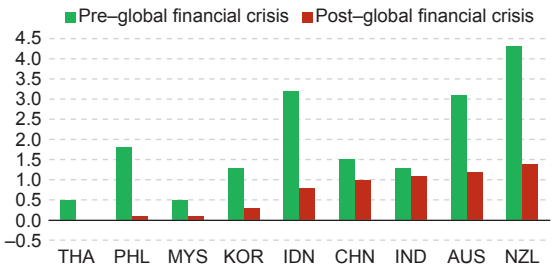
$$r_t = r_t^* + \pi_t^\theta + \alpha^* y_t + \beta * (\pi_t - \pi_t^*) + \varepsilon t, \tag{1.12.2}$$

$$r_t^* = c + \gamma * r_{f,t}^* + \psi * g_t, \tag{1.12.3}$$

where $r_{f,t}^*$ refers to the global real neutral rate (using the estimated neutral rate for the United States as a proxy) and g refers to trend growth.[4] Figure 1.12.6 shows the neutral rate estimates. After the global neutral rate is explicitly taken into account, the estimated neutral rate is generally smaller compared with that in the previous two methods, and the magnitude of decline is more pronounced in the post–global financial crisis period. In countries where trend growth has been stable, such as Indonesia, Malaysia, and the Philippines, global factors seem to have driven the neutral rate down. Figure 1.12.7 compares the impact of the global neutral rate on country-specific rates across countries. The cross-country comparison shows that the higher the degree of financial openness, the larger the impact of the global neutral rate on the domestic neutral rate. For example, in Australia, the effect of the global neutral rate is twice as large as in less open economies, such as Indonesia.

Figure 1.12.6

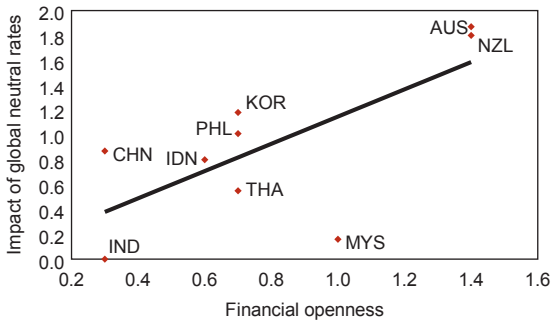
Real Neutral Rate: Extended Taylor Rule Estimates



Source: IMF staff estimates.
Note: AUS = Australia; CHN = China; IDN = Indonesia; IND = India; KOR = Korea; MYS = Malaysia; NZL = New Zealand; PHL = the Philippines; THA = Thailand. The pre–global financial crisis average refers to 2001:Q1–08:Q3. The post–global financial crisis period refers to 2008:Q4–14:Q4.

Figure 1.12.7

Impact of Global Neutral Rate on Domestic Neutral Rate versus Financial Openness



Source: IMF staff estimates.
Note: AUS = Australia; CHN = China; IDN = Indonesia; IND = India; KOR = Korea; MYS = Malaysia; NZL = New Zealand; PHL = the Philippines; THA = Thailand. Financial openness measured as the absolute size of foreign assets and liabilities (portfolio and other investments) to GDP, 2000–13 average.

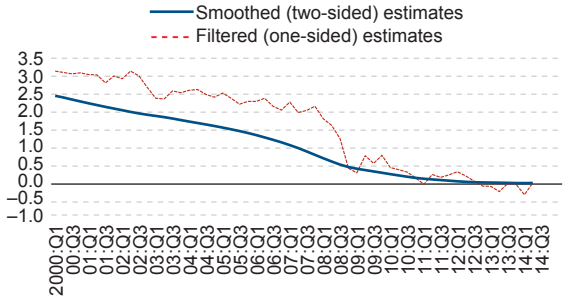
[3] The extended Taylor rule equation is estimated by generalized method of moments. A Quandt likelihood ratio test was performed to test whether the impact of the global neutral rate on local rates is time varying and the null hypothesis of stable impact cannot be rejected.

[4] The impact of the trend growth rate tends to be statistically nonsignificant in many countries once the effect of the global neutral rate is controlled for in the regression.

Box 1.12 *(continued)*

In a nutshell, standard models show that the neutral rate fell after the global financial crisis in most Asian economies because of lower trend growth. In economies in which trend growth has been stable, global factors have contributed to the falling neutral rate (Figure 1.12.8). There are several reasons behind the downward trend of the global neutral rate: on the saving side, private precautionary saving has increased since the crisis,[5] while public savings in the form of official reserves have also been on an upward trend and increased further since the crisis. The demographic shift, with aging populations close to retirement, will also contribute to higher global savings. On the investment side, the demand for investment has declined, owing to subpar growth prospects and the declining resource intensity of investment, as today's large corporations, such as information technology companies, do not need to invest heavily in plants and machinery, as was the case with more traditional industrial companies.

Figure 1.12.8
U.S. Real Neutral Rate
(Percent)



Source: Updated estimates of Laubach and Williams (2003).

[5] Admittedly, the increase in precautionary saving could be driven by cyclical factors instead of being the start of a structural change.

Box 1.13

Monetary Policy Transmission in Emerging Asia: The Role of Banks

Banks play a pivotal role in monetary policy transmission in Asia's bank-dominated financial systems. Banks are the primary financing source for the corporate sector and for households across most of Asia. However, the region's banks, even within a single country, are far from homogeneous in key characteristics that may have an impact on policy transmission.[1] Discerning how banks react to a change in monetary policy is therefore important for understanding how monetary policy affects the real economy.

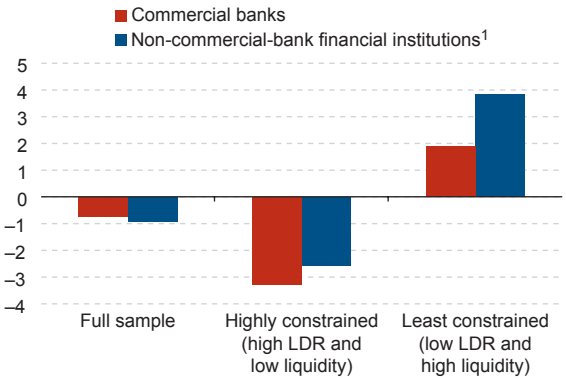
This box sheds light on how bank characteristics affect monetary policy transmission. Bank-level panel data from Bankscope are used to estimate the effect of changes in policy interest rates on loan growth.[2] The results from this bank-level analysis show that heterogeneity across banks and in banking sector structures, together with exogenous global financial conditions, help dampen the credit response to domestic monetary policy changes. Key findings are as follows:

- Banks with different financial positions or balance sheet characteristics react quite differently to a change in monetary policy. More financially constrained banks (as measured by a higher loan-to-deposit ratio or a lower liquidity ratio, compared with that of peers) will shrink their loan portfolio by more than the "average" bank (baseline effect) following a contractionary monetary policy shock (Figure 1.13.1). In fact, banks with high liquidity and low loan-to-deposit ratios contradict standard theory by continuing to expand their loan portfolios, notwithstanding the tightening of domestic monetary policy.[3]

Figure 1.13.1

Impact of a One Standard Deviation Increase in Policy Rate on Loan Growth

(Percentage points)



Source: IMF staff estimates.
Note: LDR = Loan-to-deposit ratio. The results are based on fixed-effects panel regressions of banks' (or non-commercial-bank financial institutions') real credit growth on changes in the real policy rate, controlling for global liquidity, domestic demand, bank characteristics, and bank and time fixed effects. One standard deviation = 2.6 percentage points change of policy rate (cumulative change over one year).
[1] Non-commercial-bank financial institutions include savings banks, cooperative banks, real estate and mortgage banks, investment banks, other nonbank credit institutions, specialized governmental credit institutions, and microfinancing institutions.

Prepared by Nasha Ananchotikul, Roberto Guimarães, and Dulani Seneviratne.

[1] Country-specific vector autoregressions using macroeconomic data on claims on the private sector in Asian economies suggest that the credit channel (distinct from the interest rate channel) plays a very small amplifying role for aggregate GDP. This may reflect a dampened response by individual banks to monetary policy that, in turn, depends on their structural characteristics. See Ananchotikul and Seneviratne (forthcoming).

[2] The main data set comprises commercial banks from nine Asian economies: Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore, Thailand, and Taiwan Province of China. The full sample consists of 336 banks (68 state-owned, 89 foreign subsidiaries, and 179 private domestic banks), covering close to 60 percent of the total number of banks and 80 percent of total bank assets in the sample countries. Foreign branches are not included because their balance sheet information is not identified separately from that of their parent bank, which is recorded by Bankscope as pertaining to the parent's home country. Data on 139 non-commercial-bank financial institutions are also included as a supplementary sample.

[3] This result lends support to the existence of the bank-lending channel based on the hypothesis that banks with stronger balance sheet positions will be able to protect their loan portfolio against changes in monetary policy whereas lending by weaker banks will be more sensitive to such shocks (for example, Kashyap and Stein 1995).

Box 1.13 *(continued)*

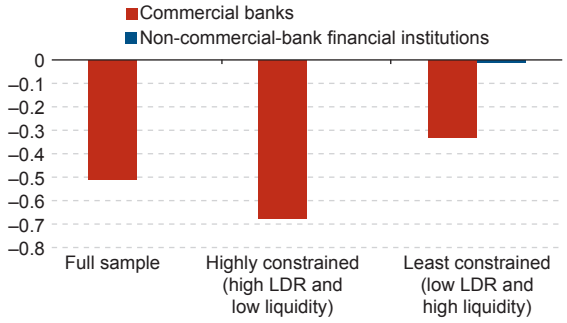
This finding also tends to hold for other types of financial institutions such as development banks, savings banks, and cooperative banks included in the non-commercial-bank financial institution sample. However, the magnitude of the effects appears different, pointing to the importance of heterogeneity in the nature of business models and mandates of financial institutions, which can be another source of differential responses to domestic monetary policy.

- Banks respond not only to changes in domestic monetary policy, but also to external financial conditions. Global liquidity conditions—proxied by the Chicago Federal Reserve's U.S. financial conditions index—are found to affect banks' loan portfolios, and the effect is stronger for financially constrained banks (Figure 1.13.2). This is relevant in the current context in which banks in some Asian economies—after a prolonged period of low global interest rates and abundant global liquidity—have started to turn to wholesale or external sources of funding and away from typically more stable deposit funding in order to sustain their loan growth. Rising loan-to-deposit ratios and increasing reliance on wholesale funding raise banks' sensitivity to external funding conditions, which are beyond the control of domestic monetary authorities.
- The effectiveness of domestic monetary policy also depends on the ownership of individual banks. Following a change in monetary policy, state-owned banks adjust their loan supply more sharply than domestic private banks (Figure 1.13.3).[4] Foreign banks are the least affected by domestic monetary policy, likely reflecting their funding ties to the parent bank, which allows them to cushion domestic monetary shocks. The overall effectiveness of monetary policy therefore depends on the relative presence of each type of bank ownership in the banking system.

Figure 1.13.2

Impact of a One Standard Deviation Change in Global Financial Conditions on Loan Growth

(Percentage points)

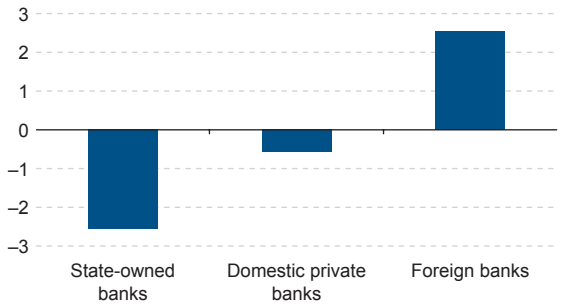


Source: IMF staff estimates.
Note: LDR = loan-to-deposit ratio. Global financial conditions are proxied by the Chicago Federal Reserve's adjusted U.S. National Financial Conditions Index. A higher index is associated with a tightening of global financial conditions. One standard deviation = 6.1 percent change of the Financial Conditions Index. The results are based on fixed-effects panel regressions of banks' (or non-commercial-bank financial institutions') real credit growth on changes in real policy rate, controlling for global liquidity, domestic demand, bank characteristics, and bank and time fixed effects.

Figure 1.13.3

Impact of a One Standard Deviation Increase in Policy Rate on Loan Growth across Different Types of Bank Ownership

(Percentage points)



Source: IMF staff estimates.
Note: The results are based on fixed-effects panel regressions of banks' (or non-commercial-bank financial institutions') real credit growth on changes in real policy rate, controlling for global liquidity, domestic demand, bank characteristics, and bank and time fixed effects. One standard deviation = 2.6 percentage points change of policy rate (cumulative change over one year).

[4] The stronger response of state-owned banks to domestic monetary policy could reflect their quasi-fiscal lending, which is not directly related to the financial characteristics of those banks.

(continued)

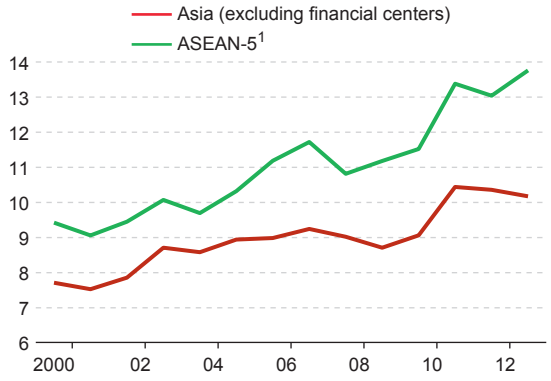
Box 1.13 *(continued)*

- Higher foreign bank penetration in the domestic banking system reduces the responsiveness of all banks' loan growth to domestic monetary policy. This reduced sensitivity extends beyond the foreign bank subsidiaries themselves to all domestic private banks. This result may suggest that foreign banks increase domestic banks' access to non-central-bank funding, such as interbank, wholesale, or external funding, making loan supply less sensitive to domestic monetary policy.[5] In addition, credit supply may be less sensitive to changes in marginal funding costs when banks are striving to preserve their loan market share in the face of increased competition due to foreign bank entry.[6] This result is especially important given the backdrop of growing foreign bank penetration in Asia (Figures 1.13.4 and 1.13.5).

Overall, the analysis here suggests that bank characteristics are an important determinant of the efficacy of monetary policy. These characteristics also interact with external financial conditions. For instance, when domestic private banks rely more on external funding, monetary policy tightening may prove less effective if global financial conditions remain comfortable. Thus, identifying key characteristics of banks and the banking system, including ownership structure, degree of competition, funding sources, and financial conditions, will be critical to gaining a better understanding of the monetary transmission mechanism.

Figure 1.13.4

Foreign Bank Share of Domestic Banking Sector Assets

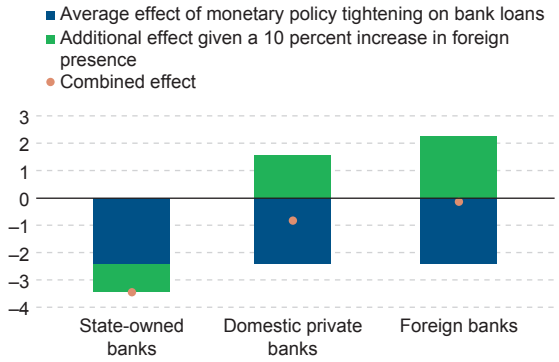


Sources: Bankscope; and IMF staff calculations.
[1] ASEAN-5 comprises Indonesia, Malaysia, Thailand, the Philippines, and Singapore.

Figure 1.13.5

Impact of Foreign Presence on Monetary Policy Transmission to Loan Growth

(Percentage points)



Source: IMF staff estimates.
Note: Change in monetary policy is measured as percentage point change in policy rate or short-term interest rate. Foreign bank presence is a percentage share of foreign bank assets in total domestic banking sector assets. The results are based on fixed-effects panel regressions of banks' (or non-commercial-bank financial institutions') real credit growth on changes in real policy rate, controlling for global liquidity, domestic demand, bank characteristics, and bank and time fixed effects. One standard deviation = 2.6 percentage points change of policy rate (cumulative change over one year).

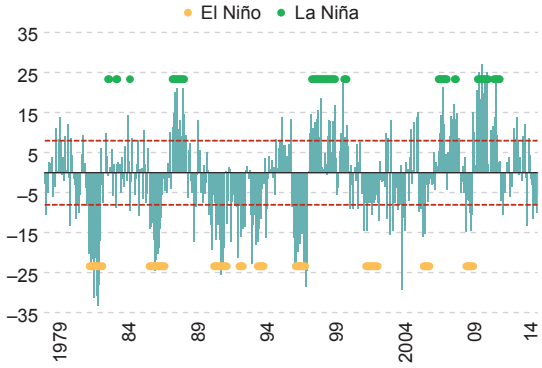
[5] Growing cross-border bank lending and increased (foreign-currency) corporate bond financing, which became evident in Asia in recent years, could further weaken the bank-lending channel of domestic monetary policy.
[6] However, separate regressions on the response of individual banks' effective interest rates to domestic monetary policy suggest that higher foreign bank participation strengthens the interest rate channel. Given the oligopolistic banking structure common in Asia, increased bank competition brought about by foreign bank entry may weaken the collusive power of the domestic incumbent banks, thus increasing the interest rate pass-through in the banking system.

Box 1.14

Climate-Economy Relationship in India

A careful understanding of the climate-economy relationship in India is essential to the effective design of appropriate institutions and macroeconomic policies. This box exploits the exogenous variation in weather-related events (with a special focus on El Niño) in a compact model of the world economy to causatively identify the effects of El Niño weather shocks on growth and inflation in India, as well as on global energy and nonfuel commodity prices.[1] El Niño is a band of above-average ocean surface temperatures that periodically (every three to seven years) develops off the Pacific coast of South America, lasts about two years, and causes major climatological change around the world. One way of measuring El Niño intensity is by using the Southern Oscillation Index (SOI), which is calculated based on air-pressure differentials in the South Pacific (between Tahiti and Darwin). Sustained SOI values below –8 indicate El Niño episodes (Figure 1.14.1).[2]

Figure 1.14.1
Southern Oscillation Index



Sources: Australia's Bureau of Meteorology; and IMF staff calculations.

While India's economic growth is moderately affected by El Niño weather events, the impact on inflation is relatively large. The extreme weather conditions brought on by El Niño usually coincide with a period of weak monsoon[3] and rising temperatures in India. Weak monsoons constrain the supply of rain-driven agricultural commodities and reduce agricultural output, construction, and services activities. The estimation results indicate that India's GDP growth would fall by 0.2 percent after the first quarter following an El Niño shock, and inflation would increase by 60 basis points after three quarters. Compared to other Asian countries, the fall in economic activity in India in response to an El Niño shock is lower than that in Australia, Indonesia, and New Zealand (Figure 1.14.2). The high-inflation "jump" in India following an El Niño weather event is due to a high weight placed on food in the consumer price index basket (47.6 percent; see Figure 1.14.3).

The El Niño weather phenomenon can substantially affect global commodity prices. The higher temperatures and droughts following an El Niño event, particularly in Asia and Pacific countries, not only increase the prices of nonfuel commodities (by 5¼ percent after four quarters), but also boost demand for coal and crude oil as lower output is generated from both thermal power plants and hydroelectric dams, thereby driving energy prices up. El Niño causes hot and dry summers in southeast Australia; increases the frequency and severity of bush fires; reduces wheat exports; and, as a result, drives up global wheat prices. El Niño–induced drought in Indonesia pushes up world prices for coffee, cocoa, and palm oil. Furthermore, mining equipment in Indonesia relies heavily on hydropower; with deficient rain and low river currents, the country can produce less nickel (of which Indonesia is the world's top exporter and which is used to strengthen steel), pushing up global metal prices.

Prepared by Mehdi Raissi and Paul Cashin.

[1] See Cashin, Mohaddes, and Raissi (2014b) for details.

[2] Sustained SOI values above 8 indicate La Niña episodes (cold phase of the Southern Oscillation).

[3] It should be noted that an El Niño year has not always resulted in weak monsoons in India. Since 1980, there have been nine El Niño events, but they have led to only six droughts in India.

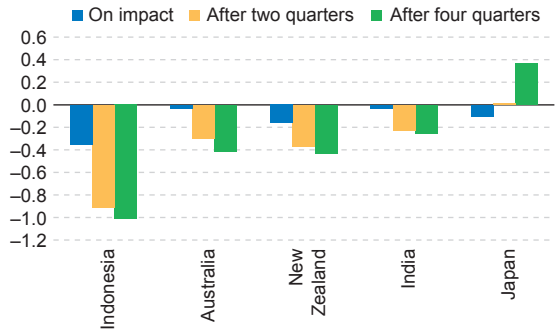
(continued)

Box 1.14 *(continued)*

Figure 1.14.2

The Effects of an El Niño Shock on Real GDP Growth

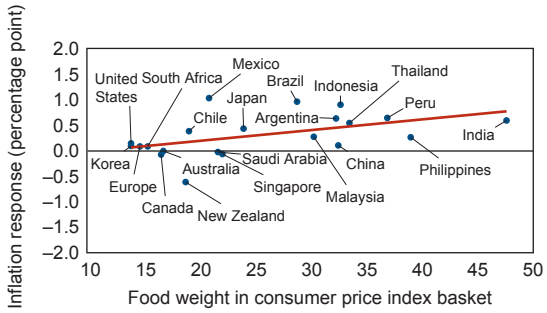
(Percent)



Sources: IMF, World Economic Outlook database; and IMF staff calculations.

Figure 1.14.3

Food Weight in Consumer Price Index Basket and Inflation Responses to an El Niño Shock



Sources: Haver Analytics; and IMF staff calculations.

Given these findings, macroeconomic policy formulation in India should consider the likelihood and effects of El Niño episodes. The sensitivity of growth, inflation, and commodity prices to El Niño developments raises the question of which policies would help ameliorate the adverse effects of such shocks. These measures could include changes in the cropping pattern and use of inputs (such as seeds of quicker-maturing crop varieties), rainwater conservation, judicious release of food grain stocks, and changes in import policies and quantities. These measures would help to bolster agricultural production in low-rainfall El Niño years. On the macroeconomic policy side, any uptick in inflation arising from El Niño shocks (rather than stronger aggregate demand) should continue to be monitored closely, and the monetary policy stance appropriately altered, to avoid the emergence of second-round inflation effects. Investment in the agricultural sector, mainly in irrigation, as well as building more efficient food value chains, should also be considered in the longer term.

Annex 1.1. Asia: Real GDP

(Year-over-year percent change)

	Actual Data and Latest Projections					Difference from October 2014 WEO		
	2012	2013	2014	2015	2016	2014	2015	2016
Asia	**5.6**	**5.9**	**5.6**	**5.6**	**5.5**	**0.1**	**0.0**	**–0.1**
Emerging Asia[1]	**6.8**	**7.1**	**6.8**	**6.6**	**6.4**	**0.3**	**0.0**	**–0.1**
Australia	3.6	2.1	2.7	2.8	3.2	–0.1	–0.1	0.1
Japan	1.8	1.6	–0.1	1.0	1.2	–1.0	0.2	0.3
New Zealand	2.4	2.2	3.2	2.9	2.7	–0.4	0.1	0.3
East Asia	**6.8**	**6.9**	**6.7**	**6.3**	**5.9**	**–0.1**	**–0.3**	**–0.5**
China	7.8	7.8	7.4	6.8	6.3	0.0	–0.3	–0.5
Hong Kong SAR	1.7	2.9	2.3	2.8	3.1	–0.7	–0.4	–0.4
Korea	2.3	3.0	3.3	3.3	3.5	–0.4	–0.7	–0.5
Taiwan Province of China	2.1	2.2	3.7	3.8	4.1	0.3	0.0	–0.1
South Asia	**5.2**	**6.8**	**7.1**	**7.3**	**7.4**	**1.4**	**1.0**	**0.9**
Bangladesh	6.3	6.1	6.3	6.8	–0.1	–0.1	0.0	
India	5.1	6.9	7.2	7.5	7.5	1.5	1.1	1.0
Sri Lanka	6.3	7.3	7.4	6.5	6.5	0.4	0.0	0.0
Nepal	4.8	3.9	5.5	5.0	5.0	0.0	0.0	0.3
ASEAN	**5.9**	**5.2**	**4.6**	**5.1**	**5.3**	**–0.1**	**–0.2**	**–0.1**
Brunei Darussalam	0.9	–1.8	–0.7	–0.5	2.8	–6.0	–3.5	–0.6
Cambodia	7.3	7.4	7.0	7.2	7.2	–0.2	–0.1	–0.1
Indonesia	6.0	5.6	5.0	5.2	5.5	–0.1	–0.3	–0.3
Lao People's Democratic Republic	7.9	8.0	7.4	7.3	7.8	0.0	0.1	0.2
Malaysia	5.6	4.7	6.0	4.8	4.9	0.1	–0.4	–0.1
Myanmar	7.3	8.3	7.7	8.3	8.5	–0.8	–0.2	0.3
Philippines	6.8	7.2	6.1	6.7	6.3	–0.1	0.4	0.3
Singapore	3.4	4.4	2.9	3.0	3.0	0.0	0.0	0.1
Thailand	6.5	2.9	0.7	3.7	4.0	–0.3	–0.9	–0.4
Vietnam	5.2	5.4	6.0	6.0	5.8	0.5	0.4	0.1
Pacific island countries and other small states[2]	**3.3**	**2.2**	**3.6**	**4.0**	**3.4**	**0.4**	**–0.5**	**0.2**
Bhutan	6.5	5.0	6.4	7.6	8.2	0.0	0.0	0.0
Fiji	1.8	4.6	4.1	3.3	3.0	0.2	0.8	0.6
Kiribati	3.4	2.4	3.8	2.9	1.5	0.8	0.2	–1.0
Maldives	1.3	4.7	5.0	5.0	3.9	0.6	0.7	–0.1
Marshall Islands	4.7	3.0	0.5	1.7	2.2	–2.7	0.0	0.8
Micronesia	0.1	–4.0	0.1	0.3	1.0	–0.5	–0.3	0.3
Palau	5.5	–0.2	8.0	2.2	2.7	6.2	0.0	0.2
Papua New Guinea	8.1	5.5	5.8	19.3	3.3	0.0	–0.2	–0.1
Samoa	1.2	–1.1	1.9	2.8	1.4	–0.1	0.6	1.9
Solomon Islands	4.7	3.0	1.5	3.3	3.0	1.4	–0.2	–1.0
Timor-Leste	7.8	5.4	6.6	6.8	6.9	0.0	0.0	0.0
Tonga	–1.1	–0.3	2.3	2.7	2.4	–0.1	–0.3	0.3
Tuvalu	0.2	1.3	2.2	2.5	2.5	0.0	0.0	0.0
Vanuatu	1.8	2.0	2.9	–4.0	5.0	–0.6	–8.0	1.0
Mongolia	12.3	11.6	7.8	4.4	4.2	–1.3	–4.0	–3.7

Sources: IMF, World Economic Outlook (WEO) database; and IMF staff projections.

[1] Emerging Asia comprises China, India, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. India's data are reported on a fiscal-year basis.

[2] Simple average for Pacific island countries and other small states, which include Bhutan, Fiji, Kiribati, Maldives, the Marshall Islands, Micronesia, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor-Leste, Tonga, Tuvalu, and Vanuatu.

Annex 1.2. Asia: Consumer Prices

(Year-over-year percent change)

	Actual Data and Latest Projections					Difference from October 2014 WEO		
	2012	2013	2014	2015	2016	2014	2015	2016
Asia	3.8	3.9	3.2	2.6	2.8	–0.4	–1.2	–1.1
Emerging Asia[1]	4.7	4.8	3.4	2.9	3.0	–0.6	–1.3	–1.2
Australia	1.8	2.4	2.5	2.0	2.3	–0.2	–0.6	–0.3
Japan	0.0	0.4	2.7	1.0	0.9	0.1	–1.0	–1.7
New Zealand	1.1	1.1	1.2	0.8	2.1	–0.3	–1.2	0.1
East Asia	**2.6**	**2.4**	**1.9**	**1.2**	**1.6**	**–0.3**	**–1.2**	**–1.3**
China	2.6	2.6	2.0	1.2	1.5	–0.3	–1.3	–1.5
Hong Kong SAR	4.1	4.3	4.4	3.2	3.4	0.5	–0.6	–0.1
Korea	2.2	1.3	1.3	1.5	2.5	–0.3	–0.9	–0.3
Taiwan Province of China	1.9	0.8	1.2	0.7	1.3	–0.2	–1.3	–0.7
South Asia	9.9	9.7	6.0	6.0	5.7	–1.7	–1.4	–0.9
Bangladesh	6.2	7.5	7.0	6.4	6.4	–0.2	–0.3	0.1
India	10.2	10.0	6.0	6.1	5.7	–1.8	–1.4	–1.0
Sri Lanka	7.5	6.9	3.3	1.7	3.4	–0.5	–3.7	–2.1
Nepal	8.3	9.9	9.0	7.1	6.3	0.0	–0.7	–0.7
ASEAN	**3.8**	**4.5**	**4.4**	**3.9**	**4.1**	**0.0**	**–1.0**	**–0.4**
Brunei Darussalam	0.1	0.4	–0.2	0.0	0.1	–0.6	–0.5	–0.4
Cambodia	2.9	3.0	3.9	–0.3	2.5	–0.7	–3.9	–0.6
Indonesia	4.0	6.4	6.4	6.8	5.8	0.4	0.0	–0.3
Lao People's Democratic Republic	4.3	6.4	4.1	4.0	5.0	–1.4	–1.3	–0.7
Malaysia	1.7	2.1	3.1	2.7	3.0	0.2	–1.4	–0.5
Myanmar	2.8	5.7	5.9	8.4	7.6	–0.6	2.1	1.0
Philippines	3.2	2.9	4.2	2.1	2.8	–0.3	–1.8	–0.7
Singapore	4.6	2.4	1.0	0.0	1.7	–0.3	–2.5	–1.0
Thailand	3.0	2.2	1.9	0.3	2.4	–0.2	–1.7	0.4
Vietnam	9.1	6.6	4.1	2.5	3.2	–1.1	–2.7	–1.7
Pacific island countries and other small states[2]	5.0	3.2	2.6	2.1	2.6	–0.7	–1.4	–0.8
Bhutan	10.1	8.7	7.7	6.3	6.1	–2.5	–2.5	–1.6
Fiji	3.4	2.9	0.5	1.5	3.0	–0.7	–1.5	0.0
Kiribati	–3.0	–1.5	2.1	1.4	0.3	–0.4	–1.1	–2.2
Maldives	10.9	4.0	2.5	0.3	2.1	–0.6	–2.7	–0.9
Marshall Islands	4.3	1.9	1.1	–0.6	1.0	–0.6	–2.4	–1.0
Micronesia	6.3	2.1	0.7	–1.0	1.9	–2.6	–3.7	–0.1
Palau	5.4	2.8	4.0	1.8	2.0	1.0	–1.7	–1.0
Papua New Guinea	4.5	5.0	5.3	4.8	5.0	0.0	–0.2	0.0
Samoa	6.2	–0.2	–1.2	3.0	2.2	0.0	–0.5	–0.2
Solomon Islands	5.9	5.4	5.1	3.8	3.4	–1.9	–1.7	–1.6
Timor-Leste	10.9	9.5	2.5	1.8	3.3	0.0	–0.5	–0.5
Tonga	2.0	1.5	1.3	0.8	1.5	–0.3	–1.5	–1.7
Tuvalu	1.4	2.0	3.3	3.1	3.0	0.0	0.0	0.0
Vanuatu	1.4	1.3	1.0	2.0	2.2	–0.6	–0.1	–0.4
Mongolia	15.0	8.6	12.9	9.2	7.6	–1.2	–3.2	–1.6

Sources: IMF, World Economic Outlook (WEO) database; and IMF staff projections.

[1] Emerging Asia comprises China, India, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. India's data are reported on a fiscal-year basis.

[2] Simple average for Pacific island countries and other small states, which include Bhutan, Fiji, Kiribati, Maldives, the Marshall Islands, Micronesia, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor-Leste, Tonga, Tuvalu, and Vanuatu.

Annex 1.3. Asia: General Government Balances

(In percent of fiscal-year GDP)

	Actual Data and Latest Projections					Difference from October 2014 WEO		
	2012	2013	2014	2015	2016	2014	2015	2016
Asia	**–3.3**	**–3.3**	**–3.0**	**–3.1**	**–2.9**	**–0.1**	**–0.7**	**–0.9**
Emerging Asia[1]	**–2.2**	**–2.8**	**–2.8**	**–3.3**	**–3.4**	**0.0**	**–0.8**	**–0.9**
Australia	–3.4	–3.0	–3.6	–3.3	–2.7	–0.2	–1.5	–1.7
Japan	–8.8	–8.5	–7.7	–6.2	–5.0	–0.6	–0.4	–0.3
New Zealand	–1.6	–0.8	–0.6	0.0	0.5	0.1	0.4	0.3
East Asia	**0.0**	**–1.0**	**–1.0**	**–1.7**	**–1.8**	**–0.1**	**–1.0**	**–1.2**
China	0.0	–1.1	–1.1	–1.9	–2.2	–0.1	–1.2	–1.4
Hong Kong SAR	3.3	1.1	5.3	3.2	2.6	2.7	2.7	0.3
Korea	1.6	0.7	0.3	0.3	0.6	0.0	–0.4	–0.4
Taiwan Province of China	–4.3	–3.2	–2.5	–2.2	–1.9	–0.1	–0.1	–0.1
South Asia	**–7.1**	**–6.9**	**–6.8**	**–6.8**	**–6.8**	**0.0**	**–0.5**	**–0.6**
Bangladesh	–3.0	–3.4	–3.0	–3.2	–3.0	–0.3	0.1	0.3
India	–7.5	–7.2	–7.1	–7.2	–7.1	0.1	–0.5	–0.6
Sri Lanka	–6.5	–5.9	–5.9	–6.7	–7.4	–0.8	–1.9	–3.1
Nepal	–0.6	2.1	2.2	1.1	0.8	0.0	0.2	0.2
ASEAN	**–1.4**	**–1.5**	**–1.8**	**–2.5**	**–2.3**	**0.4**	**–0.4**	**–0.3**
Brunei Darussalam	16.9	14.1	14.1	–15.6	–6.4	–6.4	–32.3	–25.5
Cambodia	–3.8	–2.1	–0.8	–3.1	–3.0	1.9	–0.8	–1.2
Indonesia	–1.6	–2.0	–2.2	–2.3	–2.1	0.3	0.1	0.0
Lao People's Democratic Republic	–0.5	–5.6	–3.8	–4.7	–5.6	0.7	–1.0	–1.1
Malaysia	–3.9	–4.4	–3.7	–3.5	–2.9	–0.1	–0.8	–0.2
Myanmar	–1.7	–2.0	–4.3	–6.3	–6.9	0.2	–1.6	–2.1
Philippines	–0.6	–0.1	0.5	–0.9	–1.0	0.9	0.1	0.0
Singapore	7.8	5.4	4.2	1.5	2.1	–0.1	–2.7	–2.0
Thailand	–1.8	–0.2	–1.8	–1.9	–2.0	0.6	0.7	0.5
Vietnam	–6.8	–5.9	–5.4	–6.5	–5.6	1.2	–0.4	0.1
Pacific island countries and other small states[2]	**2.3**	**5.7**	**4.0**	**–2.1**	**–1.4**	**5.2**	**–0.4**	**0.3**
Bhutan	–1.3	–4.0	–3.8	–2.4	–1.6	0.0	0.0	0.0
Fiji	–1.1	–0.5	–2.0	–3.7	–2.1	0.1	–1.1	–0.3
Kiribati	–8.6	9.3	17.1	–15.2	–7.3	42.9	5.2	12.1
Maldives	–7.9	–8.2	–10.6	–7.3	–6.4	8.6	8.4	11.8
Marshall Islands	–0.7	0.7	1.2	2.4	2.3	1.4	4.6	4.4
Micronesia	0.8	2.8	12.5	2.8	4.2	8.7	–0.9	0.8
Palau	0.9	1.2	1.2	1.7	0.9	–3.7	0.7	0.9
Papua New Guinea	–3.2	–8.0	–6.1	–5.0	–3.7	1.1	–2.6	–1.6
Samoa	–7.1	–3.8	–5.3	–3.3	–2.0	–2.7	–1.5	–0.6
Solomon Islands	3.8	4.4	1.9	–2.1	–1.6	3.5	–1.3	–1.2
Timor-Leste	51.0	59.9	25.3	9.7	7.4	1.7	–19.1	–23.8
Tonga	–1.4	0.0	0.3	–1.0	–1.1	–0.4	–0.3	–0.4
Tuvalu	9.3	26.3	23.8	–0.4	–2.2	8.0	4.0	3.3
Vanuatu	–1.6	–0.2	0.9	–5.6	–6.1	3.9	–1.7	–1.9
Mongolia	–9.1	–8.9	–11.0	–9.8	–7.8	0.2	–2.4	–1.3

Sources: IMF, World Economic Outlook (WEO) database; and IMF staff projections.

[1] Emerging Asia comprises China, India, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam.

[2] Simple average for Pacific island countries and other small states, which include Bhutan, Fiji, Kiribati, Maldives, the Marshall Islands, Micronesia, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor-Leste, Tonga, Tuvalu, and Vanuatu.

Annex 1.4. Asia: Current Account Balance

(In percent of GDP)

	Actual Data and Latest Projections					Difference from October 2014 WEO		
	2012	2013	2014	2015	2016	2014	2015	2016
Asia	**1.2**	**1.4**	**1.6**	**2.4**	**2.2**	**0.2**	**1.0**	**0.7**
Emerging Asia[1]	**1.1**	**1.1**	**1.4**	**2.2**	**2.1**	**0.3**	**1.1**	**0.8**
Australia	–4.3	–3.3	–2.8	–4.0	–3.7	0.9	–0.2	–0.5
Japan	1.0	0.7	0.5	1.9	2.0	–0.4	0.8	0.7
New Zealand	–4.0	–3.2	–3.5	–4.8	–5.2	0.7	1.1	0.7
East Asia	**3.1**	**2.8**	**2.9**	**3.9**	**3.7**	**0.3**	**1.2**	**0.7**
China	2.6	1.9	2.0	3.2	3.2	0.2	1.2	0.9
Hong Kong SAR	1.6	1.5	1.6	2.0	2.2	–0.6	–0.1	–0.3
Korea	4.2	6.2	6.3	7.1	5.2	0.5	1.3	–0.2
Taiwan Province of China	9.9	10.8	12.3	12.4	11.7	0.4	1.2	1.2
South Asia	**–4.4**	**–1.5**	**–1.4**	**–1.2**	**–1.5**	**0.5**	**0.9**	**0.7**
Bangladesh	0.7	1.2	–0.1	–0.6	–0.4	–0.2	0.0	0.2
India	–4.8	–1.7	–1.4	–1.3	–1.6	0.6	1.0	0.8
Sri Lanka	–6.7	–3.9	–3.7	–2.0	–2.6	–0.5	1.2	0.5
Nepal	4.8	3.3	4.6	4.1	2.5	0.0	0.9	0.4
ASEAN	**2.4**	**2.2**	**3.2**	**2.9**	**2.3**	**0.5**	**0.6**	**0.3**
Brunei Darussalam	34.1	34.5	23.6	–9.8	–5.6	–8.0	–39.9	–34.5
Cambodia	–11.0	–12.2	–12.0	–10.0	–9.3	–3.3	–2.4	–1.9
Indonesia	–2.7	–3.2	–3.0	–3.0	–2.9	0.3	–0.1	–0.2
Lao People's Democratic Republic	–30.2	–28.9	–24.9	–20.1	–16.3	0.5	1.1	2.0
Malaysia	5.8	4.0	4.6	2.1	1.4	0.3	–2.1	–2.9
Myanmar	–4.3	–5.1	–7.2	–7.0	–5.9	–1.9	–1.9	–0.9
Philippines	2.8	4.2	4.4	5.5	5.0	1.3	2.9	2.9
Singapore	17.2	17.9	19.1	20.7	18.8	1.5	4.0	2.7
Thailand	–0.4	–0.6	3.8	4.4	2.4	0.9	2.3	1.4
Vietnam	6.0	5.6	5.4	4.8	4.9	1.3	1.4	2.3
Pacific island countries and other small states[2]	**–6.4**	**–5.8**	**–3.2**	**–8.9**	**–8.7**	**5.8**	**2.3**	**1.7**
Bhutan	–17.6	–22.1	–21.9	–26.3	–24.6	–0.1	–0.2	2.0
Fiji	–1.8	–20.7	–8.8	–8.0	–8.2	1.4	0.8	0.8
Kiribati	–24.5	–21.8	4.1	–24.3	–26.5	57.5	29.1	22.9
Maldives	–10.6	–6.5	–8.4	–4.6	–5.9	11.2	16.1	14.3
Marshall Islands	–8.7	–13.4	–20.9	–1.3	–3.8	–0.3	9.6	7.4
Micronesia	–12.6	–10.1	2.5	–0.7	–0.8	9.5	5.7	5.2
Palau	–5.0	–6.5	–10.3	–5.4	–8.4	–4.8	–0.1	–1.3
Papua New Guinea	–53.6	–30.8	–12.1	10.2	7.1	–0.8	–3.3	–2.4
Samoa	–7.8	0.4	–3.7	–6.8	–5.5	1.6	–1.6	1.5
Solomon Islands	1.5	–4.5	–8.5	–8.4	–12.6	6.2	7.1	2.0
Timor-Leste	47.8	44.8	26.1	11.2	10.9	1.7	–18.5	–20.4
Tonga	–15.6	–12.6	–8.9	–6.8	–5.8	–5.7	–2.2	0.4
Tuvalu	25.3	26.4	27.0	–39.0	–24.5	–0.7	–1.8	–1.5
Vanuatu	–6.5	–3.3	–1.3	–14.4	–13.4	4.5	–8.4	–6.4
Mongolia	–27.4	–25.4	–8.2	–11.1	–17.3	5.9	4.0	–1.4

Sources: IMF, World Economic Outlook (WEO) database; and IMF staff projections.

[1] Emerging Asia comprises China, India, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. India's data are reported on a fiscal-year basis.

[2] Simple average for Pacific island countries and other small states, which include Bhutan, Fiji, Kiribati, Maldives, the Marshall Islands, Micronesia, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor-Leste, Tonga, Tuvalu, and Vanuatu.

2. Reaping the Benefits from Global Value Chains

Introduction and Main Findings

Over the past 30 years, the growing technological complexity of products, trade liberalization, and lower transportation and communications costs have reshaped the landscape of global trade. In particular, production has become increasingly fragmented through the growing prevalence of global value chains (GVCs), with components crossing numerous international borders. This has resulted in faster growth of trade in intermediate inputs than of trade in final goods. Asia has especially exemplified this new pattern of production: during 1995–2013, the region's trade in intermediate goods grew by a factor of six, while trade in final goods grew almost four times. This compares with fourfold and threefold increases, respectively, in the rest of the world.

The rise of GVCs calls for a different mindset in calibrating economic policies and, in particular, three major areas of policy consideration emerge:

- Integration into GVCs brings benefits beyond those traditionally associated with international trade in final goods, reflecting the more granular division of production and task specialization, which enables each participating country to exploit finer comparative advantage niches and raises the benefits from economies of scale and scope. Indeed, empirical evidence (such as Baldwin and Yan 2014) shows that joining GVCs brings positive and significant gains in productivity. In this connection, a relevant policy question is, what factors and policies foster greater participation in GVCs?
- While participation in GVCs is largely beneficial, the GVC pie is not sliced equally. As illustrated by the classic example of the iPod supply chain by Dedrick, Kraemer, and Linden (2010), Apple—a U.S.-based company—captures between one-third and one-half of an iPod's retail price while Japanese firms such as Toshiba and Korean firms such as Samsung capture another major share as profits from producing high-value components such as the hard disk drive, display, and memory. By contrast, it is estimated that firms and workers in China capture no more than 2 percent from assembling the product. Given that capturing a bigger slice of the GVC pie is positively associated with productivity gains and higher per capita growth, a route for Asian emerging market economies to escape the middle-income trap and for low-income economies to sustain strong growth over the medium term could be to reposition themselves toward higher-value stages of production. In this connection, an important policy question is, what factors and policies cause economies to capture a bigger slice of the GVC pie?
- The rise of GVCs also has important macroeconomic implications. One aspect relates to the increase in interconnectedness among countries, which Chapter 3 of the April 2014 *Regional Economic Outlook: Asia and Pacific* addresses. A second aspect is that the rising importance of GVCs may have altered the traditional relationship between exchange rate movements and competitiveness because imports of intermediate goods in a GVC are inputs into exports. Therefore, the impact of exchange rate changes on trade may change and could be dampened or amplified depending on an economy's position in the GVC.

This chapter sheds light on these issues by focusing on the following: first, it documents key stylized facts about Asia's GVC participation, where within GVCs Asian economies are situated, and how much of the GVC pie they capture. It then assesses which factors support GVC

Note: The authors of this chapter are Kevin Cheng (lead), Dulani Seneviratne, and Shiny Zhang. The analysis relies on Cheng and others (forthcoming).

participation and helps raise the captured share of value added. Finally, it examines how GVC participation affects the impact of exchange rate changes on external competitiveness.

The chapter relies on a unique Organisation for Economic Co-operation and Development–World Trade Organization database on trade in value added for GVCs covering 57 countries, which became available only recently, to address these questions—an impossible task just a few years ago. The main findings are the following:

- While the rise of GVCs has been ubiquitous across the globe, the expansion has been particularly pronounced among Asian emerging market economies, including those in the Association of Southeast Asian Nations (ASEAN). Moreover, Asian economies, particularly China, have captured an increasingly larger share of the value added generated in GVCs, even after adjustments are made for their recent rapid growth in relative economic size. Some advanced Asian economies, notably Korea, have also captured a bigger slice of the GVC pie in high-tech manufacturing. By contrast, adjusted for relative economic size, shares of value added in GVCs accruing to Japan and advanced economies outside Asia have declined.
- Both advanced and emerging market economies in Asia have moved upstream (that is, providing intermediate inputs to other countries) rather than downstream (processing inputs from more upstream countries) in GVCs. Within high-tech manufacturing, Asian advanced economies remain substantially more specialized in upstream production than Asian emerging market economies.
- Moving toward a more upstream position in production and raising economic complexity—a measure of an economy's productive knowledge and capabilities (see Box 2.1)—are associated with a growing share of GVC value added captured by countries.
- The rise of GVCs has altered the responsiveness of trade volumes to exchange rate changes. Based on a new measure of GVC-adjusted real effective exchange rates (REERs), both GVC-related exports and imports react positively to a real depreciation, with upstreamness (downstreamness) tending to amplify (dampen) the impact. These results are intuitive: the gain in export competitiveness from a real depreciation in a country upstream in the production chain will "trickle down" along the GVC, leading to increased exports. But the benefits will also "trickle up," as the derived demand for imports used in the production of exports will also rise, even though imports become relatively more expensive. However, for a country farther downstream, where production and exports have a higher foreign content relative to domestic content, the positive impact of a real depreciation on export (and import) volumes is blunted. This is because the higher cost of imports used in the production of exports tends to offset the lower cost of domestic content in exports. In the case of exports and imports of goods not produced by GVCs, the impact of REER changes is in line with the standard trade literature; that is, exports (imports) react positively (negatively) to a real depreciation.
- A future challenge for policymakers, particularly in emerging market and frontier economies, will be to foster GVC participation and to expand these economies' share of the GVC pie while minimizing spillover risks associated with increased trade linkages. This will require reducing trade barriers, strengthening infrastructure, enhancing human capital formation, supporting research and development (R&D), improving institutions, and strengthening resilience to shocks.

Key Stylized Facts

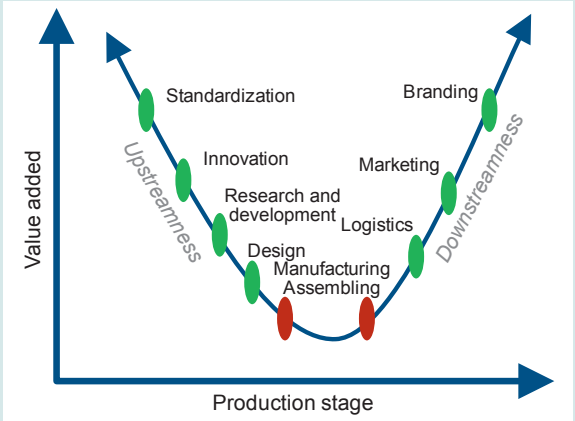
What Are GVCs?

A GVC is a network of interlinked stages of production for the manufacture of goods and services that straddles international borders. Typically, a GVC involves combining imported intermediate goods

and domestic goods and services into products that are then exported for use as intermediates in the subsequent stage of production.

A standard GVC encompasses a number of production stages from upstream product conception to midstream assembly and then to downstream branding and marketing. As Figure 2.1 illustrates, a hypothesis in the GVC literature is that the relationship between the production stage and value added exhibits a "smiley" shape, suggesting that most value added in a GVC accrues to firms at the two ends of the production line, such as R&D in the upstream and marketing in the downstream, with a smaller share of value added captured by assembly in the midstream.

Figure 2.1
A Hypothesized "Smiley-Shaped" Relationship between Value Added and Global Value Chain Position



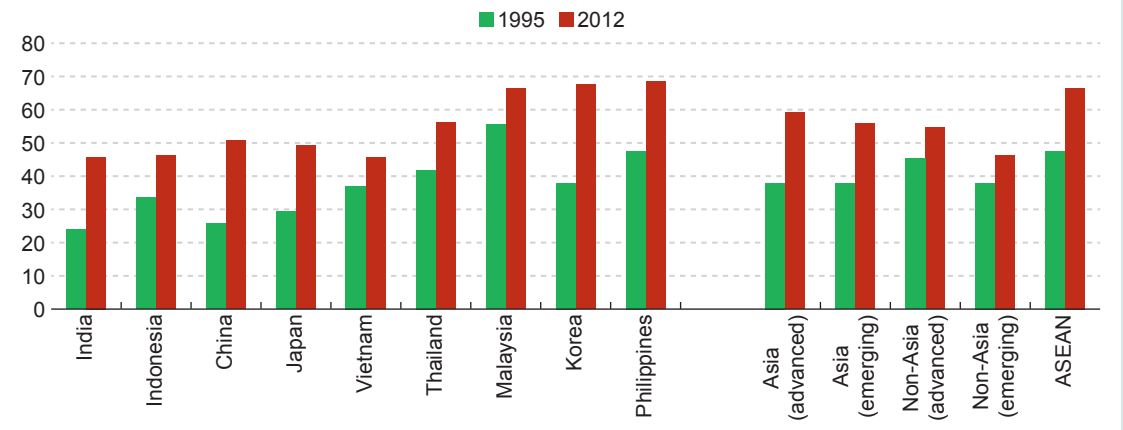
Source: World Economic Forum (2012).

How Much Do Asian Economies Participate in GVCs?

The extent to which an economy is engaged in a GVC can be measured by the GVC participation index, developed by Koopman and others (2010). The index is defined as the ratio to a country's gross exports of the sum of foreign value added in domestic exports (backward participation) and domestically produced intermediates to be used in third countries (forward participation). This measure therefore excludes exports of final goods that have no foreign-input content.

As Figure 2.2 shows, the extent of GVC participation has been relatively high in Asia, including in Korea, Malaysia, and the Philippines. The growth in GVC participation has also been

Figure 2.2
Participation in Global Value Chains: 1995 versus 2012
(Share of foreign inputs and domestically produced inputs used in third countries' exports in a country's gross exports; in percent)



Sources: Organisation for Economic Co-operation and Development and World Trade Organization, Trade in Value–Added database; and IMF staff estimates.
Note: ASEAN = Association of Southeast Asian Nations. Non-Asia includes comparable advanced and emerging market economies.

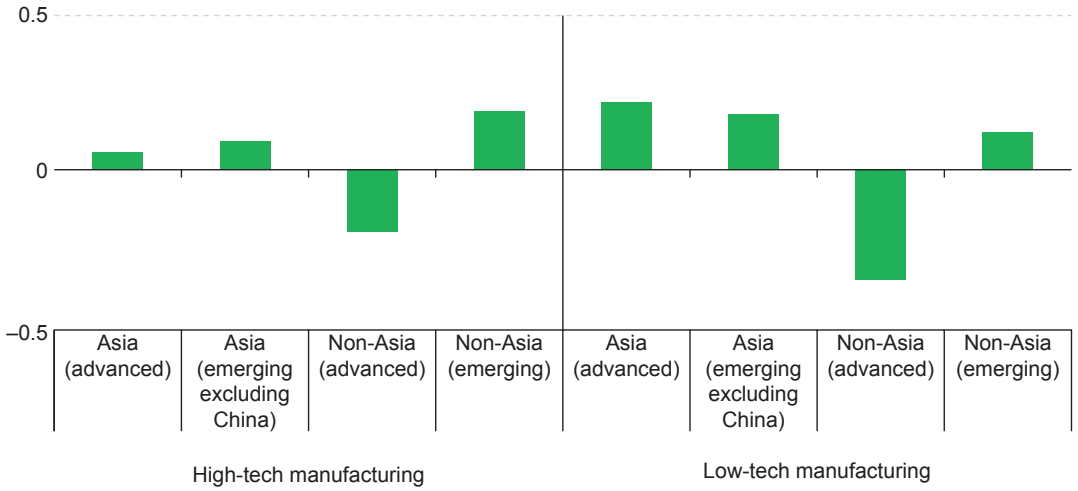
faster in Asia, particularly in ASEAN. China's participation also grew significantly during 1995–2012, likely reflecting its accession to the World Trade Organization, although China's participation rate is lower than the Asian average.

How Are GVC Pies Sliced?

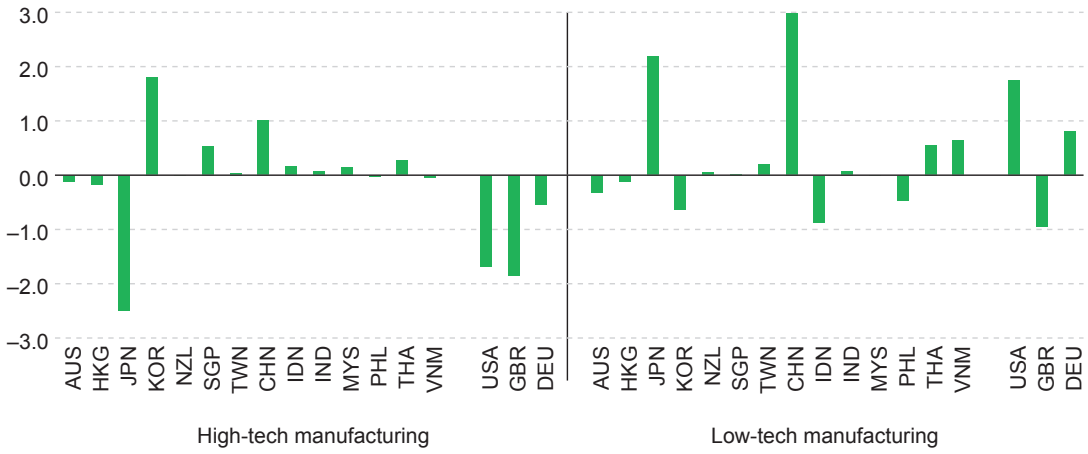
The GVC pie is not sliced evenly, and the shares of value added captured by economies vary over time and across sectors. Figure 2.3 illustrates the

Figure 2.3
Domestic Value-Added Share in Global Value Added

1. Domestic Value-Added Share by Industry: Change from 1995 to 2009
(Share in percent of world's DVA in the industry; adjusted for the GDP share)



2. Domestic Value-Added Share by Industry: Change from 1995 to 2009
(Share in percent of world's DVA in the industry; adjusted for the GDP share)



Sources: Organisation for Economic Co-operation and Development and World Trade Organization, Trade in Value-Added database; and IMF staff estimates.
Note: DVA = domestic value added. High-tech manufacturing includes chemicals and nonmetallic mineral products, electrical and optical equipment, transportation equipment, machinery, and equipment not elsewhere classified. Low-tech manufacturing includes food products, beverages, and tobacco; textiles, textile products, leather, and footwear; wood, paper, paper products, printing, and publishing; basic metals and fabricated metal products; and manufacturing not elsewhere classified and recycling. DVA values are adjusted for the GDP share by taking the residual after regressing the DVA share on the GDP share. Countries are classified into advanced and emerging market economies based on IMF World Economic Outlook database classifications. Country abbreviations in panel 2 use the three-letter International Organization for Standardization country codes.

dynamics within GVCs for Asia and elsewhere. Key patterns can be summarized as follows:

- During 1995–2009, both advanced and emerging market economies in Asia gained value-added shares in GVCs, but the gains were larger in low-tech than in high-tech manufacturing. Outside Asia, emerging market economies gained, while advanced economies lost, shares in GVCs during the same period (Figure 2.3, panel 1).
- Among individual countries, Japan's value-added share in high-tech manufacturing was significantly eroded, while Korea gained in share of value added during the same period (Box 2.2). China has also moved up GVCs, but the gain is most significant in low-tech manufacturing. Advanced economies outside Asia, notably Germany, the United Kingdom, and the United States, have lost value-added shares in high-tech manufacturing and gained them in low-tech manufacturing (Figure 2.3, panel 2).

Upstreamness versus Downstreamness

Upstreamness (or downstreamness) refers to where an economy is located in a GVC. One measure, developed by Fally (2012), looks at how many stages of production remain before the final product reaches consumers (referred to as "distance to final demand"). A long distance to final demand suggests that a country is upstream in the production process, such as a producer of raw materials or product design and research. Conversely, a short distance to final demand suggests that a country is downstream in the production process, such as customer service.

Figure 2.4 illustrates the main characteristics of upstreamness and downstreamness in Asia. Key patterns include the following:

- In high-tech manufacturing, advanced economies tend to specialize in upstream stages, while emerging market economies specialize in more downstream stages. This differentiation is more pronounced in Asia, where Asian advanced economies are more upstream than their counterparts in the rest of the world, with the opposite holding for Asia's emerging market economies. During 1995–2008, Asian economies moved upstream relative to the rest of the world (Figure 2.4, panel 1).
- Among individual countries, Asian advanced economies (Hong Kong Special Administrative Region, Korea, Singapore) are generally located upstream in high-tech manufacturing, whereas the region's emerging market economies, such as China, India, and Vietnam, are generally located downstream (Figure 2.4, panel 2).
- In low-tech manufacturing, both advanced and emerging market economies in Asia have moved slightly upstream, but have remained downstream relative to the rest of the world. Unlike in high-tech manufacturing, there is no dichotomy between emerging and advanced economies in Asia in regard to upstreamness and downstreamness in low-tech manufacturing.

How Can Economies Increase GVC Participation?

Impact of Tariffs on Intermediate Goods

Several factors may affect the extent to which an economy participates in GVCs. Tariffs on intermediate goods significantly increase costs associated with trade in intermediate goods, thereby reducing participation. Indeed, GVCs tend to amplify the distortionary impacts of tariffs, as these are compounded along GVCs when intermediate inputs are traded across borders numerous times throughout the entire production chain. As Blanchard (2015) indicates, fragmentation essentially increases the so-called effective rate of protection, even if tariffs and other trade costs remain unchanged.

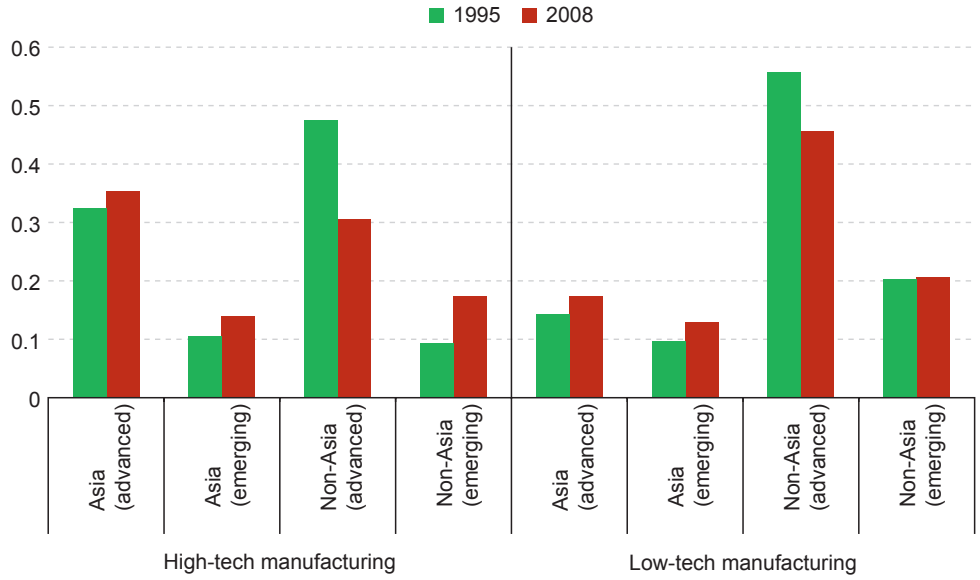
Empirically, there is indeed a strong negative correlation between tariff rates on intermediate

Figure 2.4

Upstreamness or Downstreamness

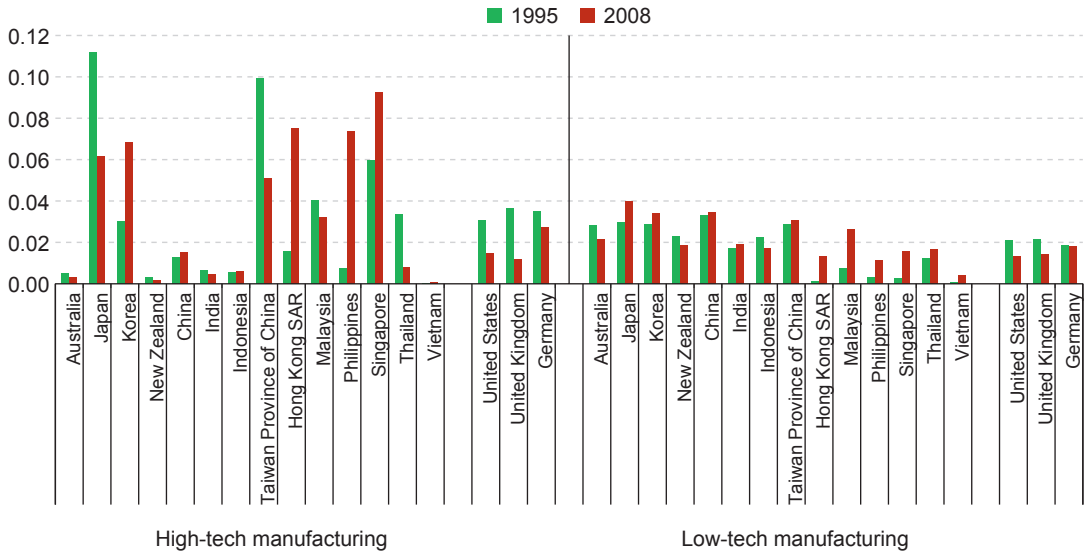
1. Relative Distance to Final Demand, Weighted Average

(By region and industry type; adjusted for changes in length over time)



2. Relative Distance to Final Demand, Weighted Average

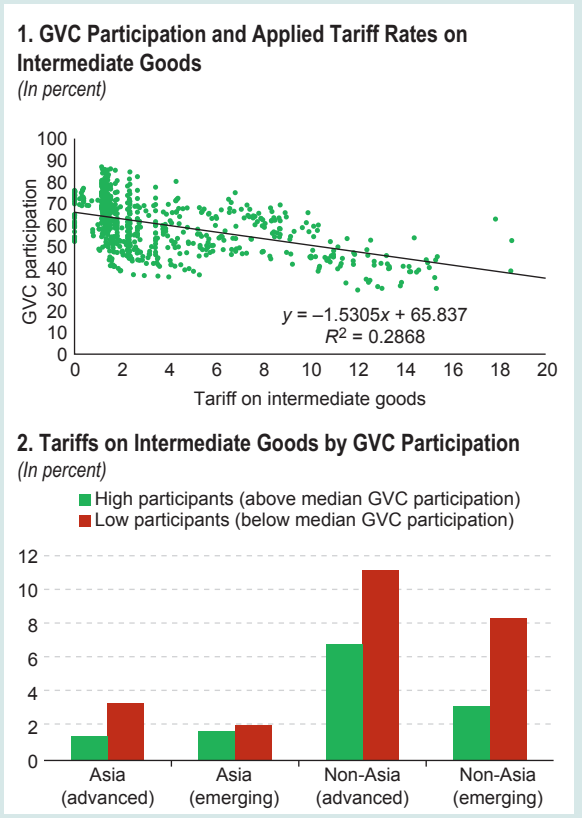
(Normalized by the length of the sectoral value chains)



Sources: Organisation for Economic Co-operation and Development and World Trade Organization, Trade in Value-Added database; and IMF staff estimates.

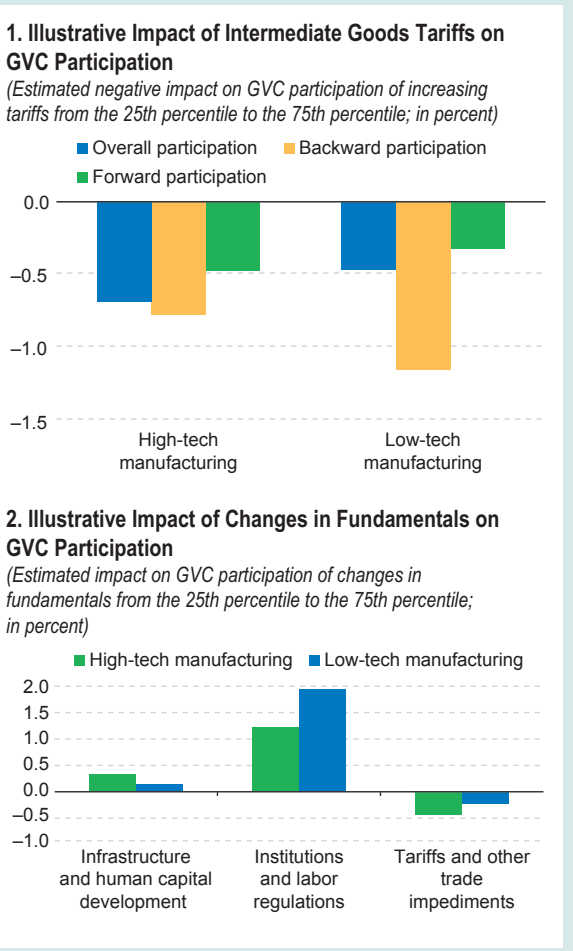
Note: Given that production processes have become more fragmented, the length (total number of production stages) has increased. Therefore, the distance to final demand as shown in the figure in each year in each industry has been adjusted for changes in length. The underlying data for distance to final demand are based on Fally (2012).

Figure 2.5
Tariffs and GVC Participation



Sources: Organisation for Economic Co-operation and Development and World Trade Organization, Trade in Value-Added database; United Nations Conference on Trade and Development, Trade Analysis Information System (TRAINS) database; and IMF staff estimates.
Note: GVC = global value chain.

Figure 2.6
Illustrative Impact: GVC Participation



Source: IMF staff estimates.
Note: GVC = global value chain. The illustrative impact of tariffs is not so small, as the GVC participation index subcategories are measured against (i.e., the denominator) total exports in the economy; for instance, median backward and forward participation rates in the low-tech manufacturing sectors are typically 3–6 percent. Underlying data on the effective tariff rates are measured using the weighted average across sectors.

goods and GVC participation (Figure 2.5, panel 1). Across Asia and elsewhere, economies with higher tariffs on their intermediate goods imports are less likely to participate in GVCs. Notably, Asian emerging market economies that participate less in GVCs impose higher effective tariff rates on intermediate imports (Figure 2.5, panel 2).

Taking this analysis further, the chapter explores empirically whether the impact of tariffs differs depending on whether forward participation (using domestic intermediate goods for export to a third country) or backward participation (using foreign inputs in exports) is involved. The main results, shown in panel 1 of Figure 2.6, suggest that

- Tariffs on intermediate goods have a significant negative effect on GVC participation, both backward and forward, in high-tech and low-tech manufacturing. Specifically, if a country moves from the 25th to 75th percentile of the cross-country distribution of tariffs (an increase in tariffs), GVC-linked trade (i.e., participation) will decline by ¾ percentage point to 1¼ percentage points of gross exports depending on the depth of backward and forward linkages. The estimated impact is not so small, particularly for low-tech manufacturing industries, given that the median backward and forward participation rates are typically 3 percent to 6 percent.

- Overall, the negative impact on backward participation (the import content in exports of the tariff-imposing country) is found to be larger than the negative impact on forward participation (the extent to which domestic production of the tariff-imposing country is used as inputs by a third country). Thus, the distortionary effect on the tariff imposer's imports is higher than the carry-forward effect on its exports. Furthermore, the results are strongest in regard to low-tech manufacturing.

Impact of Fundamentals

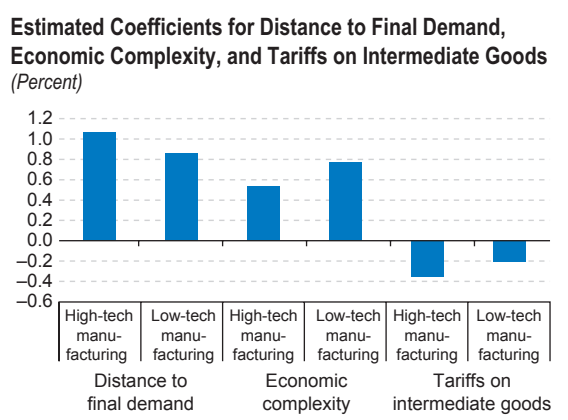
In addition to tariffs, economic and institutional fundamentals are also found to play a role in determining the extent of GVC participation (Figure 2.6, panel 1). Empirical analysis (see Box 2.3 for details) finds that, in addition to low tariffs and other trade impediments, good infrastructure, high human capital development, and strong political and legal institutions, as well as less restrictive labor market regulations, all positively contribute to greater GVC participation.

How Can an Economy Capture a Bigger Slice of the GVC Pie?

As noted, the GVC pie is not sliced evenly, and capturing a bigger piece generally implies a higher level of GDP. An econometric analysis (see Box 2.3 for methodology) is employed here to assess which factors underlie an economy's ability to acquire a greater share of value added along the GVC. This analysis focuses on a number of explanatory variables, including upstreamness and economic complexity, as well as the level of tariffs on intermediate goods. Key findings and interpretations include the following (Figure 2.7):[1]

Figure 2.7

Assessing the Link between Moving Up Global Value Chains, Upstreamness, Economic Complexity, and Tariffs



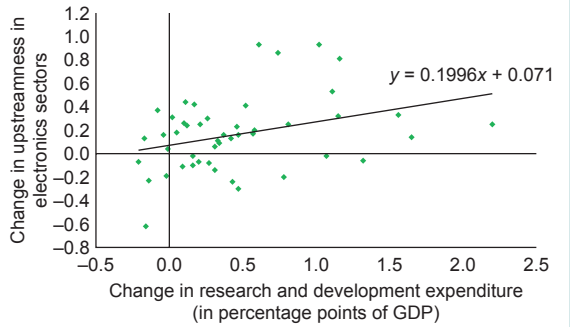
Source: IMF staff estimates.

- Overall, economies in the upstream—measured by a longer distance to final demand—tend to capture a larger share of the value added generated in GVCs than more downstream economies. The impact of upstreamness on the ability to increase the share of value added captured from GVCs is larger in high-tech manufacturing than in low-tech manufacturing. Intuitively, this may reflect the fact that upstreamness typically involves activities with higher value added such as R&D (Figure 2.8), and R&D plays a greater role in high-tech manufacturing (such as electronics).[2]
- Not surprisingly, countries with greater economic complexity have tended to capture a larger share of the value added from GVCs than those with lower economic complexity. Economic complexity has a greater impact, however, for low-tech manufacturing than for high-tech manufacturing.

[1] Specifically, in the absence of data at the product level, one cannot fully infer from the data the nature of the task—such as R&D versus raw materials or assembling versus marketing—that each economy specializes in at each GVC position.

[2] These econometric results, which are based on industry-level data, need not be inconsistent with the "smiley shape" hypothesis discussed earlier, as this applies at the individual product level.

Figure 2.8
Research and Development Expenditure and Upstreamness



Sources: International Institute for Management Development, World Competitiveness database; Organisation for Economic Co-operation and Development and World Trade Organization, Trade in Value-Added database; and IMF staff calculations.

- In addition to lowering their participation in GVCs, economies that impose higher tariff rates on intermediate goods are also less likely to increase their share of GVC value added conditional on their participation in these production networks. The negative impact is higher in high-tech manufacturing than in low-tech manufacturing.

Effect of Exchange Rate Changes within a GVC

The traditional relationship between exchange rates and trade volumes may be altered—even reversed—in the context of GVCs because imports are inputs into exports along the production chain. For example, a real exchange rate appreciation that decreases a country's exports may also depress its imports of intermediate goods. Garcia-Herrero and Koivu (2009) find that an appreciation of the Chinese renminbi leads to a decline in total exports to China from a number of Asian countries, possibly pointing to Asian countries' dependence on China's exports in the context of a GVC.

Similarly, using a computed partial-equilibrium simulation, Riad and others (2012) find that a downstream position in a GVC cushions the impact of an exchange rate change on both exports and imports. This reflects the higher foreign content in the downstream country's exports, which mitigates the impact of a change in its own exchange rate because the appreciation implies that imports become cheaper.

To further empirically assess these propositions, the chapter estimates export and import equations, distinguishing trade in non-GVC final goods from trade in intermediate goods. Specifically, using a panel framework with time and country fixed effects, the analysis regresses exports or imports on REER, demand, and other control variables. To gauge the importance of countries' positions in GVCs (upstream or downstream), an interaction term between upstreamness and REER is included.[3]

The novelty in the approach is twofold. First, instead of the traditional REER measure that uses weights based on gross trade, it employs weights based on domestic value added in exports. This avoids the potentially large distortion inherent in traditional REER measures coming from the inclusion of GVC-related reexports, as discussed in IMF (2013). Second, unlike previous studies, such as Garcia-Herrero and Koivu (2009) that rely on proxies for intermediate and non-GVC goods, this chapter uses the Organisation for Economic Co-operation and Development–World Trade Organization database, allowing division of trade flows into (non-GVC related) final goods and GVC-related goods. Key findings, presented in Table 2.1, include the following:

- Not surprisingly, the estimated sign of the impact of a REER change on trade in final goods not produced in GVCs is in line with traditional trade theory. Specifically, a real appreciation leads to a decline in export volumes of final goods and an increase in imports of final goods. A country's position in GVCs does not affect the impact of REER changes on trade in non-GVC products.
- A real depreciation leads to an increase in GVC-related exports, and the quantitative

[3] To circumvent, though not eliminate, the endogeneity issue, lagged values of explanatory variables are used as regressors.

Table 2.1. Exchange Rate Competitiveness in Final Goods versus GVCs

	(1)	(2)	(3)	(4)
	Final Demand		GVC	
Variables	Imports for Final Demand	Exports for Final Demand	GVC-Related Imports	GVC-Related Exports
Lagged log (REER-value-added-based)	0.395***	–0.247***	–0.296*	–0.285**
	(2.939)	(–4.792)	(–1.736)	(–2.091)
REER-upstreamness interaction (REER × upstreamness)	**–0.048**	**0.070**	**–0.060**	**–0.149*** **
	(–1.278)	**(1.671)**	**(–1.049)**	**(–3.447)**
Lagged log (demand)	0.385***	0.365**	0.427**	0.378**
	(3.156)	(2.637)	(2.282)	(2.519)
Time fixed effects	Y	Y	Y	Y
Country fixed effects	Y	Y	Y	Y
Additional controls	Y	Y	Y	Y
Clustering	Country level	Country level	Country level	Country level
Number of observations	209	209	176	176
R-squared	0.869	0.863	0.910	0.940
Number of country code	52	52	52	52

Source: IMF staff estimates.
Note: GVC = global value chain; REER = real effective exchange rate. Specification: log (Exports [Imports] volume)$_{c,t}$ = $\alpha_t + \alpha_c + \alpha_1 \log(\text{REER})_{c,t-1} + \alpha_2 \log(\text{REER})_{c,t-1} \times (\text{Upstreamness})_{c,t-1} + \alpha_3 \log(\text{Demand})_{c,t-1} + \alpha_i \log(\text{Controls})_{c,t} + \varepsilon_t$. Additional controls included in the specifications are log of real stock of foreign direct investment, upstreamness, tariffs, and output gap. Demand is proxied by GDP. Robust *t*-statistics are in parentheses.
*p < 0.1; **p < 0.05; ***p < 0.01.

impact is larger for a country operating upstream in production chains. This result is quite intuitive, because the gain in competitiveness of an upstream economy trickles down the GVC, thereby amplifying the impact. On the other hand, the impact is dampened for countries downstream in GVCs as their exports have a higher import content, such that currency depreciation also implies more expensive imports.

- In contrast to standard import elasticities, a real depreciation raises GVC-related imports because the depreciation-induced rise in exports leads to an increase in the derived demand for imports of intermediate inputs used in the production of exports. Upstreamness tends to amplify this impact, although the amplification (i.e., interaction) effect is not statistically significant.

Using the estimated coefficients, Figure 2.9 presents the impact of a real appreciation on GVC-related trade. Specifically, for high-tech manufacturing, the impact of an appreciation on trade is larger in advanced Asia than in emerging Asia or the rest of the world. This is because Asia's advanced economies tend to be relatively more upstream than other economies in high-tech manufacturing. In low-tech manufacturing, the impact is more uniform across regions, reflecting a more balanced regional distribution of upstreamness in low-tech manufacturing.

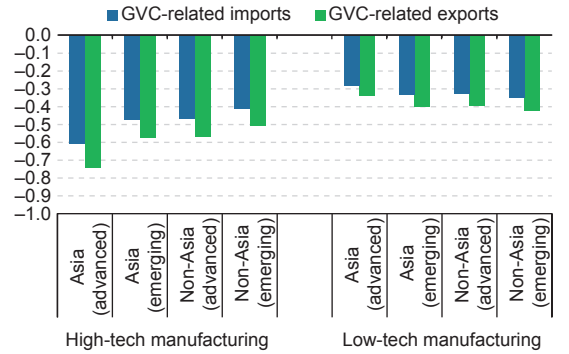
Conclusions and Policy Implications

Asian economies have increased their participation in GVCs, captured an increasingly bigger slice of the GVC pie, and relocated toward upstream production. In addition, upstream production (particularly in high-tech manufacturing), a higher degree of economic complexity, and a lower level of tariffs on intermediate goods are associated with improved prospects for capturing a higher share of value added along a GVC.

Meanwhile, the rise of GVCs has also altered the responsiveness of trade to exchange rate changes, since within a GVC, in which imports are essentially inputs into exports, a real depreciation may induce an increase in imports of intermediate goods. Moreover, this responsiveness is found to depend on a country's

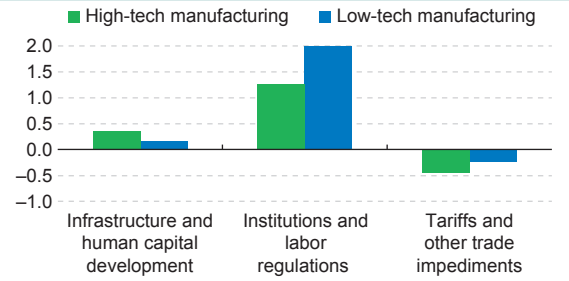
Figure 2.9

Illustrative Impact of 1 Percent Appreciation in the Real Effective Exchange Rate on GVC-Related Trade



Illustrative Impact of Changes in Fundamentals on GVC Participation

(Estimated impact on GVC participation of changes in fundamentals from the 25th percentile to the 75th percentile; in percent)

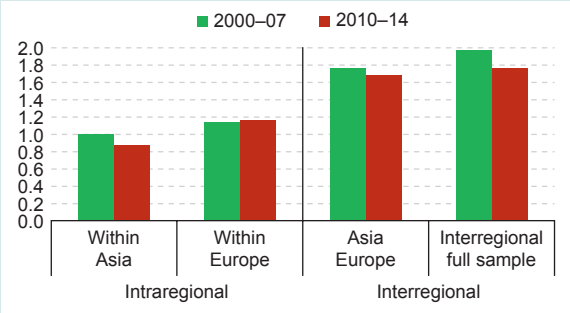


Source: IMF staff estimates.
Note: GVC = global value chain. The illustrative impact of tariff is not so small, as the GVC participation index subcategories are measured against (i.e., the denominator) total exports in the economy; for instance, median backward and forward participation rates in the low-tech manufacturing sectors are typically 3–6 percent. Underlying data on the effective tariff rates are measured using the weighted average across sectors.

Figure 2.10

Average Exchange Rate Variability, 2000–14

(Standard deviation of monthly change in bilateral exchange rates [U.S. dollar/national currency])



Source: IMF staff calculations.
Note: Intra-Asia and Intra-Europe include major regional trading partners. Asian regional trading partners include China, Japan, Korea, India, Indonesia, Malaysia, the Philippines, Singapore, Taiwan Province of China, and Thailand. European regional trading partner currencies include the euro, the European Union's 27 non-euro member currencies, Norwegian krone, Icelandic króna, and Swiss franc.

position in the GVC, with upstreamness (downstreamness) amplifying (dampening) the effect. This has important policy implications:

- For a downstream country, the effect of a real depreciation may be muted in the presence of GVCs. This is because at late stages in the production chain, exports have a high import content and the increased cost of intermediate imports tends to offset any boost to exports from the lower cost of domestic value added, thereby partly undermining the price competitiveness gain typically associated with depreciation.
- For a country upstream in the GVC, exchange rate shifts may entail large trade flow responses in the country whose currency has depreciated, as well as those further down—and even up—the value chain as price competitiveness gains work their way through the GVC.
- Therefore, the increased interconnectedness and trade spillovers brought about by GVCs tend to complicate assessments of how exchange rate changes might impact trade. To limit these concerns, members of individual value chains may be more inclined to keep their currencies aligned. Indeed, exchange rate variability among currencies within different regional supply chains—such as those in Asia and those in Europe—is considerably lower than across regional supply chains (Figure 2.10).

For Asian economies, integration into GVCs has provided an important path for transitioning from low- to middle-income status and, in a few instances, for moving up to advanced economy status. The main policy challenge is to secure these gains while exploring opportunities to capture an even larger slice of the GVC pie by repositioning

toward higher-value-added production. Against this background, key policy lessons include:

- *Removing trade barriers*—The chapter's empirical analysis finds that tariffs on imports of intermediate goods reduce GVC participation, but also hamper an economy's ability to capture a higher share of value added along a GVC once the economy is a member of a GVC. This is because when intermediate inputs cross borders multiple times, they compound the detrimental effect of a given trade barrier. In fact, within a GVC, imports are essentially inputs into exports, and thus any trade barrier imposed by an economy on its imports of intermediate goods is effectively a tax on that economy's own exports. Against this background, removing tariffs and other forms of trade barriers would benefit all GVC participants. More specifically, as indicated in IMF (2015), advanced economies should focus on opening services markets, while emerging market economies should move away from import substitution policies and avoid protectionism in the form of nontariff barriers.

- *Facilitating trade and regional cooperation*—Apart from eliminating trade impediments, policymakers should go a step further to reduce costs of trade, for example, by implementing trade-facilitating measures such as simplifying port and customs procedures. Regional trade agreements and cooperation will also help. In particular, given the high GVC participation of ASEAN economies, commitments for greater regional integration under the ASEAN Economic Community, beginning at the end of 2015, are welcome.

- *Enhancing human capital formation and technology development*—Upstreamness is generally associated with capturing a higher share of value added along a GVC, particularly in high-tech manufacturing, likely reflecting the higher value added of R&D and similar activities. Accordingly, shifting upstream requires a wide range of knowledge- and technology-enhancing measures. These include investing in human capital as well as measures to encourage innovation and R&D.

- *Improving fundamentals*—Enhanced participation in GVCs and economic sophistication also require a host of efficiency-enhancing structural reforms. These include better infrastructure, a more efficient regulatory framework, and stronger economic and legal institutions, as well as unwinding overly rigid labor market regulations.

- *Mitigating GVC-related risks*—In the presence of GVCs, a supply shock originating in one part of a GVC—such as the 2011 tsunami in Japan—may propagate to all downstream and upstream countries in the GVC unless there are built-in redundancies through duplication or sufficient inventories. Accordingly, participation in GVC networks may make countries more vulnerable to spillovers from external shocks, thus calling for more policy coordination across borders. Participants should strengthen their economies' resilience to macroeconomic shocks as well as ensure adequate financial safety nets.

Box 2.1

What Underlies Economic Complexity?

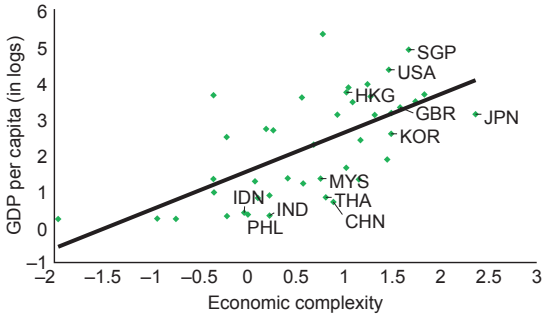
An important concept related to global value chains is the economic complexity index (ECI). Developed by Hidalgo and Hausmann (2009), the ECI is a holistic measure capturing a country's productive knowledge and capabilities. A higher index value suggests that a country is capable of producing a more *diverse* range of products and products that are less *ubiquitous* among other countries. Hidalgo and Hausmann (2009) showed that a high ECI has led to higher growth in per capita income over time (Figure 2.1.1, panel 1).

While the ECI has generally increased across the globe, compared with that of economies at similar income levels outside Asia, the ECI for Asia is lower (Figure 2.1.1, panel 2). Indeed, key emerging market economies in Asia, including China, India, and Indonesia, have a relatively low ECI. Likewise, some advanced economies in Asia, such as Japan and Korea, have lower ECIs than Germany, the United Kingdom, and the United States. (Figure 2.1.1, panel 3). Relative to that in the rest of the world, the ECI—which captures productive knowledge and capabilities and has been shown to be positively correlated with faster income growth—has risen in Asia. The ECI is found to be driven by better institutional quality, enhanced macroeconomic stability, and greater trade openness. However, ECIs for Asia, including China and India, remain low.

Despite its importance, there has been little research on what drives the ECI. Against this background, this box assesses the index's key drivers. In the absence of a theoretical model for the drivers of the ECI, the Bayesian model averaging approach is used to select from a wide range of factors that may explain the ECI. Specifically, the approach starts with thousands of plausible socioeconomic variables that might affect the ECI and uses the Bayesian model averaging to narrow the list of variables; variables with a probability less than 0.5 of inclusion among the explanatory variables are eliminated from the selection. Based on Bayesian model averaging, five variables are selected, including geographical distance from the rest of the world, size of government, trade openness GDP per capita, and composite institutional quality.

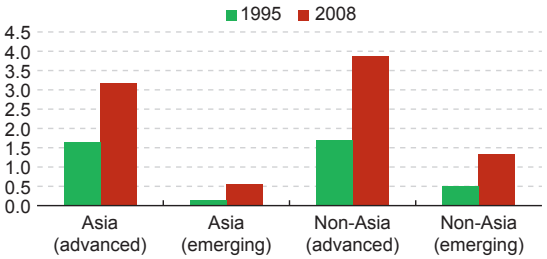
Figure 2.1.1
Economic Complexity

1. Economic Complexity and GDP per Capita, 2008

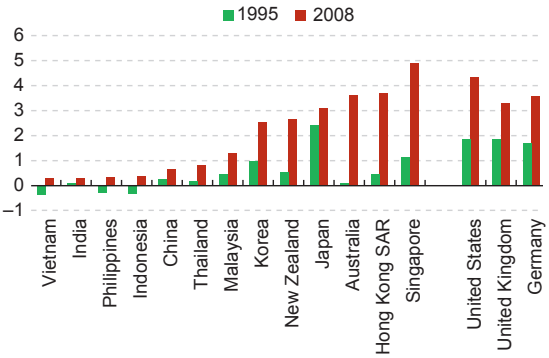


2. ECI by Region

(Weighted by purchasing power parity GDP share)



3. ECI by Country



Sources: Atlas of Economic Complexity (for the ECI); Penn World Table 8.0; United Nations, Comtrade database; and IMF staff estimates.
Note: ECI = economic complexity index. The ECI is calculated using an iterative method, where the average value of the measure is calculated with the initial values being a country's diversification and a product's ubiquity; measured as a z-score. Country labels in panel 1 use International Organization for Standardization country codes. Non-Asia (advanced) = Austria, Canada, Denmark, France, Finland, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, United States, and United Kingdom. Non-Asia (emerging) = Argentina, Bulgaria, Brazil, Chile, Hungary, Mexico, Poland, Saudi Arabia, Turkey, and South Africa.

Prepared by Kevin Cheng, Sidra Rehman, and Shiny Zhang. For further methodological details, see Cheng and others (forthcoming).

(*continued*)

Box 2.1 *(continued)*

The ECI is then regressed on these five variables using the following panel equation, with country fixed effects for 93 countries during 1980 to 2010:[1]

$$ECI_{c,t} = \alpha_{c,t} + \beta_1(\text{GDP per capita})_{c,t-1} + \beta_2(\text{Trade Openness})_{c,t-} + \beta_3(\text{Distance})_{c,t-1} + \beta_4(\text{Size of Government/GDP})_{c,t-1} + \beta_5(\text{Composite Institutional Quality})_{c,t-1} + \alpha_c + \varepsilon_{c,t}.$$

The main results, shown in Table 2.1.1, suggest that the ECI is positively correlated with greater trade openness and higher institutional quality, but negatively correlated with geographic distance from the rest of the world and size of government.

Table 2.1.1. Drivers of Economic Complexity (Panel BMA Best Specification)

	(1)	
Dependent Variable: ECI	**Coefficient**	**Standard Error**
GDP per capita (lag 1)	–0.027	(0.026)
Trade openness (lag 1)	0.341***	(0.078)
Distance weighted by GDP (lag 1)	–0.901***	(0.118)
Size of government (lag 1)	–0.095***	(0.026)
Composite institutional quality (lag 1)	0.170***	(0.025)
Number of observations	136	
R-squared	0.773	
Robust standard error	Y	
Time dummy	Y	

Source: IMF staff estimates.
Note: BMA = Bayesian model averaging. *** $p < 0.01$.

[1] To address the endogeneity issue, a two-step, least-squares approach is estimated in which the GDP per capita variable is estimated in the first step and the corresponding predicted values are used for the ECI regression.

Box 2.2

Case Study: Comparing Electronics Value Chains in Korea and Japan

Japan's and Korea's shares of world value added in electronics production chains have shifted significantly over time. During 1995–2009, Japan's share halved from 22 percent to 11 percent, while Korea's increased from 3½ percent to 6 percent. Over the same period, the shares captured by Germany and the United States also declined, although the U.S. share is somewhat higher than Japan's. However, scaling value-added shares according to a country's share of world GDP indicates much larger growth in Korea's value added from electronics, which is consistent with the country's greater specialization into electronics global value chains (GVCs) (Figure 2.2.1, panel 1). What might explain these developments? This box sheds light on this by drawing inferences from the behavior of key GVC statistics for the two countries' electronic sectors.

Key Developments in GVC Statistics

Over this period, GVC developments in these two economies showed a few similarities as well as differences:

- Their electronics production chains lengthened (i.e., the number of production stages has increased), implying greater fragmentation of production and thus providing the opportunity for increased task specialization. These production chains are longer than those in Germany and the United States. The increase in the number of production stages reflects the increasing role of other countries in Japanese and Korean electronics chains. However, the increase in fragmentation is much greater in Korea than in Japan, largely owing to the higher foreign content in Korea's electronics production chain, which has an index value between two and three times that in Germany, Japan, and the United States (Figure 2.2.1, panel 2).
- The share of electronics GVC-related value added in gross exports—also known as GVC participation in the electronics sector—in both countries is much higher than that for the rest of the world, including those of Germany and the United States. In addition, GVC participation in Korea has increased at a much faster pace over the past decade than in Japan (Figure 2.2.1, panel 3).
- Specialization in higher-value-generating tasks in electronics value chains—typically positioned toward the early or late stages of the production process—has increased in Korea. Specifically, Korea has moved more upstream in electronics GVCs—as shown by a significant increase in the distance to final demand—relative to Japan and elsewhere, such as Germany and the United States, whose GVC positions are roughly similar to that of the median country (Figure 2.2.1, panel 4). This suggests that Korea has become more specialized in higher-value-generating intermediate electronics inputs, while Japan's upstreamness has increased only at a marginal pace.
- The role of technology intensity within the electronics sector in Japan and Korea has also changed. Dividing the electronics sector further into high-tech and medium-tech electronics shows that Korea reoriented its specialization from medium-tech electronics in early 2000 toward high-tech electronics. In the 1990s and early 2000s, more than 70 percent of value added in the electronics sector in Japan came from high-tech electronics industries, while the most recent input-output tables show that only 40 percent of electronics' value added in the country's exports is derived from high-tech electronics industries. In contrast, Korea's high-tech value added in exports was less than 40 percent in the early 2000s, while over 90 percent of the country's value added in exports now comes from high-tech electronics sectors (Figure 2.2.1, panel 5).

Factors Underpinning Korea's Success in Electronics GVCs

A brief look at firm-level data[1] for firms operating in the electronics industry shows an increase in value added captured by firms in Korea. Gross margins—a firm-level proxy for domestic value added (Shin, Kraemer, and

Prepared by Dulani Seneviratne.

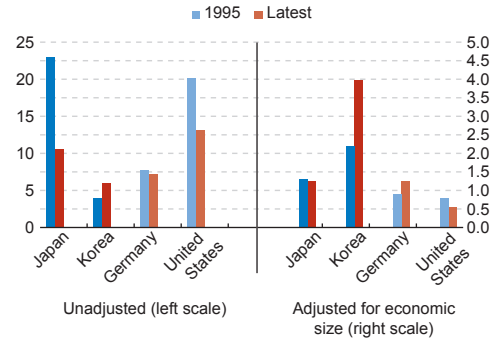
[1] Firm-level data are from Orbis and cover both listed and unlisted firms in the electronics sector in Japan and Korea; the data set includes more than 900 firms.

(*continued*)

Figure 2.2.1

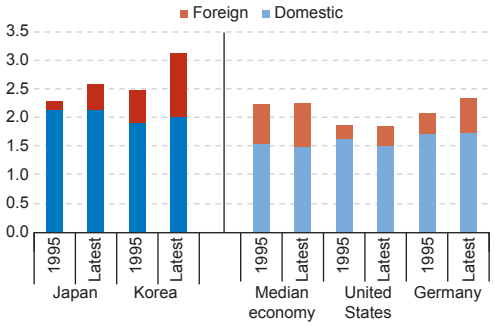
1. The share of value captured within the electronics sector has shifted in both Korea and Japan.

Domestic Value-Added Share in Electronics
(In percent of world's electronics value added)



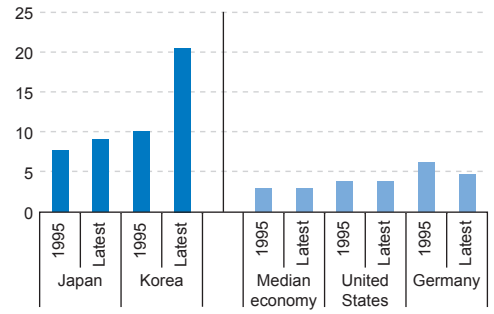
2. The fragmentation in production processes—task specialization—has increased.

Length of Electronics GVCs
(Index)



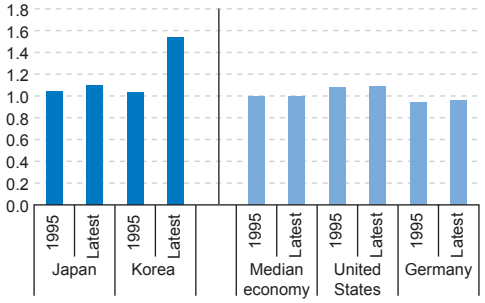
3. Electronics GVC participation has increased more in Korea ...

Electronics GVC Participation
(In percent of gross exports)



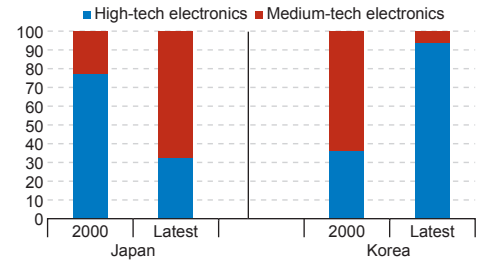
4. ... as well as specialization in higher-value-generating upstream tasks.

Upstreamness in Electronics GVCs: Distance to Final Demand
(Higher index = more upstream; in relative terms where the median = 1)



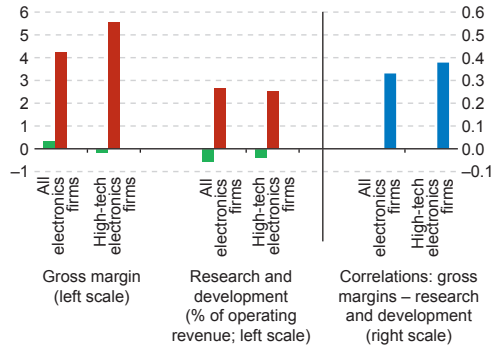
5. The role of technology intensity within the electronics sector has changed ...

High-Tech versus Medium-Tech Electronics Value Added in Electronics Exports
(In percent of electronics exports)



6. ... while firm-level data also show an increase in high-tech electronics firms' value added in Korea, driven by productivity improvements.

Electronics Firms: Change in Average Profit Margins and Research and Development Spending, and Pearson Correlation Coefficients
(Left scale: in percentage points; right scale: between –1 and +1)



Sources: Bureau Van Dijk, Orbis database; Organisation for Economic Co-operation and Development and World Trade Organiztion, Trade in Value-Added database; Organisation for Economic Co-operation and Development, International Input-Output Tables; and IMF staff calculations.
Note: GVC = global value chain.

(*continued*)

Box 2.2 *(continued)*

Dedrick 2012)—increased only slightly in Japan within the last decade, while in Korea gross margins increased about 4 percent for the average firm. In Japan, gross margins of high-tech electronics firms—which are typically either very upstream or downstream—deteriorated on average within this time frame, while in Korea, gross margins of high-tech firms improved more than the electronics industry's overall average (Figure 2.2.1, panel 6).

What might account for this trend? Oikawa (2008) associates the weak Japanese gross margins in electronics with declining research and development, investment, and human capital. The correlation between research and development spending and gross margins is indeed positive in the sample of firms considered; in addition, intellectual property rights, capital expenditure, and worker productivity are also positively correlated with gross margins. In a nutshell, all of the firm-level data, as well as the macro-level GVC indicators, suggest that maintaining and improving competitiveness in electronics value chains will depend on the ability to continually raise productivity.

Box 2.3

Assessing Drivers of GVC Participation and Moving Up in GVCs

GVC Participation

With the rapid growth and complexity in global value chains (GVCs), there has been a widespread recognition among policymakers of the importance of GVCs; thus this is an area in which continued research is needed to identify how GVCs work, how they affect economic performance, and what policies help economies derive greater benefits through GVCs (Organisation for Economic Co-operation and Development [OECD] 2013). With the increase in research in this area by scholars and organizations such as the OECD, the United Nations Conference on Trade and Development, and the Asian Development Bank, drivers of GVCs are frequently discussed in value chain literature given the importance of GVCs in growing linkages and opportunities, as well as challenges to export performance. Changes to business and regulatory environments, shifts in business strategies at the firm level, adequate infrastructure, access to trade finance, and barriers such as tariffs and investment restrictiveness are identified as factors that would fuel GVC participation with the right set of policies or hinder GVC activities if wrong policies are enacted (Blanchard 2015; Hummels and Schaur 2012; OECD 2013; OECD, United Nations Conference on Trade and Development, and World Trade Organization 2013; World Trade Organization 2014).

Against this background, this box assesses the empirical determinants of GVC participation with the following explanatory variables: level of development, infrastructure and human capital development, institutions and labor regulations, and tariffs and other trade impediments. Panel regressions are run separately for high-tech and low-tech manufacturing sectors, controlling for time and country fixed effects.

The key results, presented in Table 2.3.1, suggest that—with the level of income controlled for—better fundamentals such as a sound regulatory environment, human capital development (education, health), basic infrastructure, and lower tariffs and other trade barriers tend to increase a country's participation in GVCs. While the results show that these drivers contribute to the emergence of GVCs, industry-specific determinants of GVC participation also matter. As the Asian Development Bank (2013) notes, drivers across industries vary, specifically low-tech versus high-tech manufacturing, and to improve GVC participation, countries need to improve the quality of local institutions and infrastructure quality to make it conducive to technological upgrading and integrated industrial production. This requires continued upgrading within and between industries. The results illustrate that precise relevant variables vary between high-tech and low-tech manufacturing. For instance, while human capital may improve trade in GVCs, basic education is a significant driver of participation only for low-tech manufacturing. In regard to high-tech manufacturing, what matters is the improvements to the quality of education, probably owing to the technology intensity in most of these industries. Moreover, in low-tech manufacturing sectors, the analysis finds that a conducive business climate to create an employment base with internationally competitive minimum wages and other standards would improve GVC participation.

Capturing a Greater Share of Value Added in GVCs

The following analysis assesses the link between an economy's ability to capture a greater part of the value added generated in global industry and three explanatory variables—upstreamness (measured by distance to final demand [DFD]), the economic complexity index (ECI), and tariffs on intermediate goods—while controlling for relative economic size (measured by the share of GDP in global output).

Prepared by Kevin Cheng, Dulani Seneviratne, and Shiny Zhang. For further methodological details, see Cheng and others (forthcoming).

(*continued*)

Box 2.3 *(continued)*

Table 2.3.1. Drivers of Increased Participation in Global Value Chains

	(1)	(2)
	GVC Participation: High-Tech Manufacturing	GVC Participation: Low-Tech Manufacturing
Dependent Variable: log (PI)	**Coefficient**	**Coefficient**
Level of Development		
Real GDP per capita (lag 1)	0.153***	–0.268***
Infrastructure and Human Capital Development		
Infrastructure (lag 1)	0.079***	0.128**
Years of schooling (lag 1)		0.551**
Quality of education system (lag 1)	0.053**	
Health expenditure (lag 1)	0.079**	
Institutions and Labor Regulations		
Governance (lag 1)	0.230***	
Laxity of labor regulations (lag 1)		0.264***
Tariffs and Other Trade Impediments		
Distance weighted by economic size (lag 1)		–0.325***
Trade restrictiveness (lag 1)	–0.115**	
Investment restrictiveness (lag 1)		–0.364***
Tariff on intermediate goods (lag 1)	–0.118***	–0.074*
Number of observations	431	346
R-squared	0.993	0.824
Robust standard errors	Y	Y
Country and time fixed effects	Y	Y

Source: IMF staff estimates.
Note: GVC = global value chain; PI = participation index. *p < 0.1; **p < 0.05; ***p < 0.01.

Relative economic size is controlled for because as an economy expands, its share of value added along a GVC should naturally rise, and the interest here is in the gain in share of value added along GVCs above and beyond the impact of economic size. Estimation is based on the following panel estimation with industry, country, and year fixed effects:

$$\log(\text{DVA Share})_{c,i,t} = \alpha_t + \alpha_{c,t} + \alpha t_i + \alpha_{c,t} + \beta_1 \log(\text{GDP Share})_{c,t-1} + \beta_2 \log(\text{DFD})_{c,i,t-1} + \beta_3 \log(\text{ECI})_{c,i,t-1} + \beta_4 \log(\text{Tariffs})_{c,i,t-1} + \varepsilon_{c,i,t}.$$

where DVA is domestic value added. Key results, shown in Table 2.3.2, suggest that upstreamness and the ECI have led to an increasing share of value added along a GVC captured by a country. On the other hand, in addition to hampering a country from participating in GVCs, a higher rate of tariffs on intermediate goods has led to a decreasing share of value added along a GVC captured by a country.

(*continued*)

Box 2.3 *(continued)*

Table 2.3.2. Capturing a Bigger Slice of the Pie in Global Value Chains

	(1)		(2)	
	High-Tech Manufacturing		Low-Tech Manufacturing	
Dependent Variable: Log (DVA)	Coefficient	Standard Error	Coefficient	Standard Error
Log (GDP)	0.874***	(0.12)	0.678***	(0.10)
Log (DFD)	1.065**	(0.42)	0.860**	(0.43)
Log (ECI)	0.531	(0.34)	0.770***	(0.20)
Log (Tariff)	–0.359***	(0.09)	–0.211**	(0.10)
Number of observations	723		939	
R-squared	0.882		0.77	
Industry fixed effects	Y		Y	
Country fixed effects	Y		Y	
Year fixed effects	Y		Y	
Cluster standard errors	Country and industry		Country and industry	
Classification	High-tech manufacturing		Low-tech manufacturing	

Source: IMF staff estimates.
Note: DFD = distance to final demand; DVA = domestic value added; ECI = economic complexity index.
**$p < 0.05$; ***$p < 0.01$.

3. Drivers of Financial Integration: Implications for Asia

Introduction and Main Findings

Since the Asian financial crisis, Asian policymakers have encouraged greater financial cooperation and integration within the region. Important steps taken include regional liquidity support arrangements through the Chiang Mai Initiative Multilateralization, the Asian Bond Fund, the Asian Bond Market Initiative, and financial forums such as the Association of Southeast Asian Nations Plus Three and the Executives' Meeting of East Asia–Pacific Central Banks.[1] The Association of Southeast Asian Nations (ASEAN) has also outlined plans to foster capital market integration, including by building capital market infrastructure and harmonizing regulations (Almekinders and others 2015).[2]

While not an end in itself, regional financial integration is being pursued because it is expected to bring important benefits to Asia (Box 3.1). Financial integration promises higher productivity and living standards, not least by improving the allocation of savings and investment. In particular, it could help direct the large savings of aging populations in some countries toward high-return projects in dynamic economies with significant investment needs. Deeper financial integration may also foster financial inclusion (Box 3.2). Nevertheless, further regional financial integration also carries risks, including of heightened vulnerability to contagion, which would result in larger output volatility.

That said, the empirical evidence thus far indicates that Asian economies maintain stronger financial links with the rest of the world than with other economies in the region (Borensztein and Loungani 2011; Eichengreen and Park 2004; Garcia-Herrero, Yang, and Wooldridge 2008; Pongsaparn and Unteroberdoerster 2011). And Asia's financial integration with the remainder of the world lags behind trade integration within Asia (April 2014 *Regional Economic Outlook: Asia and Pacific*).

This chapter takes a fresh look at the status of financial integration within Asia and at possible factors hindering progress. More specifically, it addresses the following questions: Has Asia's regional financial integration risen? How does it compare to that of other regions? What are the drivers of financial integration? And hence, what are the implications for Asian policymakers who want to achieve deeper financial integration within the region?[3]

The main findings are the following:

- The degree of financial integration within Asia has increased but remains relatively low, especially when compared with Asia's high degree of trade integration. While about 60 percent of Asia's exports and imports go to, or originate from, elsewhere within the region, only 20 percent to 30 percent of cross-border portfolio investment and bank claims are intraregional.
- Financial linkages within Asia are less strong than those within the euro area and the

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Note: The authors of this chapter are Nasha Ananchotikul and Edda Zoli (lead). Shi Piao provided research assistance. The analytical underpinnings to this chapter are presented in Ananchotikul, Piao, and Zoli (forthcoming).

[1] See Jee-young (2008) for an overview of all these regional initiatives.

[2] For example, in January 2007, ASEAN leaders affirmed their commitment to the creation of the ASEAN Economic Community by 2015 and "to transform ASEAN into a region with free movement of goods, services, investment, skilled labor, and freer flow of capital" (ASEAN 2008, p. 2).

[3] The focus is on intraregional integration since this is part of Asian policymakers' agenda. The chapter does not assess whether policymakers should pursue deeper financial integration within the region or with the rest of the world.

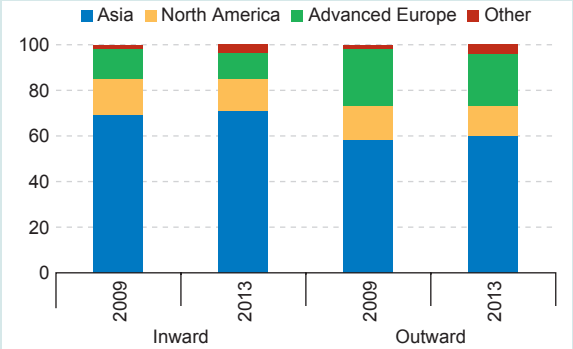
European Union, but tighter than those in Latin America. Financial integration—as measured by cross-border portfolio transactions—is stronger among ASEAN members than among other Asian economies.

- Intraregional financial flows within Asia have risen much faster than regional GDP over the past decade, reflecting the region's strong investment activity and high savings. In contrast, intraregional financial flows within the European Union and Latin America have grown more slowly relative to GDP.
- Home bias—that is, the tendency to invest more in one's home country than abroad—is particularly strong in Asia, limiting cross-border financial transactions within the region.
- Cross-border portfolio investment assets and bank claims increase with the size and sophistication of financial systems and the extent of trade integration. Restrictions on foreign asset holdings, informational asymmetries, barriers to foreign bank entry, and differences in regulatory and institutional quality create obstacles to financial integration.
- Therefore, initiatives to advance Asian policymakers' agenda toward deeper regional integration could include steps to further promote financial market development and trade linkages, while reducing informational asymmetries through increased financial disclosure and reporting requirements. Lowering regulatory barriers to capital movements and foreign bank entry, as well as harmonizing regulation, especially for investor protection, contract enforcement, and bankruptcy procedures, appear particularly important.

Regional Financial Integration in Asia: Recent Trends

Data on cross-border portfolio investment and bank claims suggest that Asia's intraregional financial integration has deepened since the early 2000s. Nevertheless, Asian economies' cross-border financial linkages are stronger with economies outside the region than within the region, especially when the roles of Hong Kong Special Administrative Region (SAR) and Singapore in intermediating inflows from the rest of the world are taken into account.

Figure 3.1
Asia: Foreign Direct Investment
(Percent of total foreign direct investment to and from Asia)



Sources: IMF, Coordinated Direct Investment Survey database; and IMF staff calculations.

Portfolio Asset Holdings

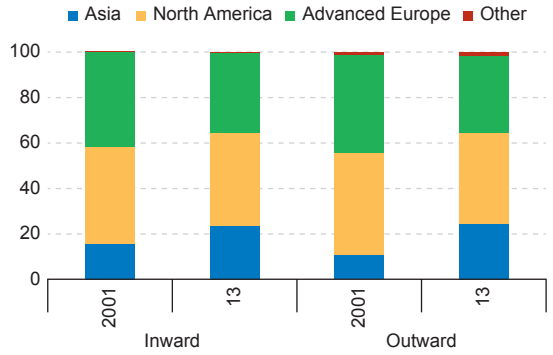
Available information indicates that in contrast to foreign direct investment (FDI), most of Asia's portfolio investment still originates from, or is directed, outside the region (Figures 3.1 and 3.2).[4] Between 60 percent and 70 percent of Asian FDI is intraregional—with transactions between China and Hong Kong SAR accounting for nearly half the total. Conversely, most portfolio investment coming into Asia originates from the United States

[4] Data on FDI are from the IMF Coordinated Direct Investment Survey on bilateral investment positions. Data on bilateral cross-border portfolio investment are from the IMF's Coordinated Portfolio Investment Survey. The latter provides information on bilateral international portfolio holdings, that is, bilateral foreign asset and liabilities stocks. These data are subject to limitations. Country coverage is incomplete, since participation in the surveys is voluntary. Also, information on ultimate investors or ultimate recipients is not included in the surveys.

Figure 3.2

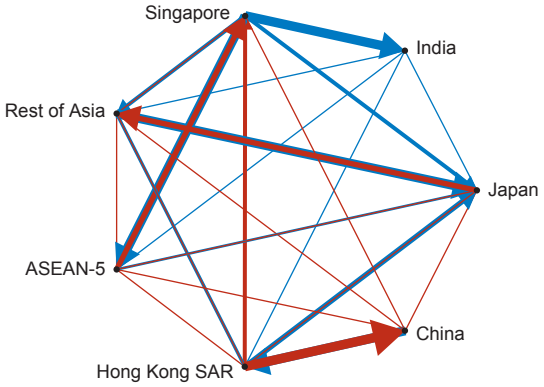
1. Asia: Foreign Portfolio Investment

(Percent of total foreign portfolio investment to and from Asia)



2. Foreign Portfolio Investment Assets

(Percent of total foreign portfolio investment assets of the source country or region)



Sources: IMF, Coordinated Portfolio Investment Survey database; and IMF staff calculations.
Note: ASEAN-5 = Indonesia, Malaysia, the Philippines, Singapore, and Thailand.

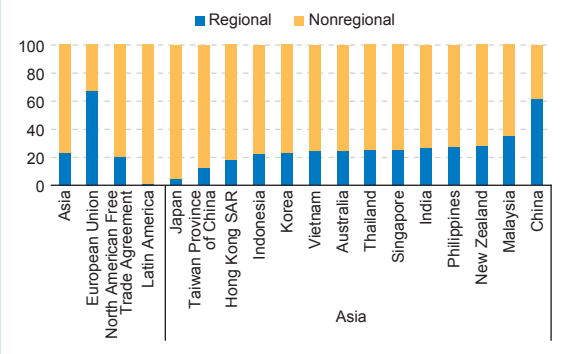
and Europe's advanced economies, although the share of Asian origin increased from about 15 percent in 2001 to about 23 percent in 2013. This is consistent with domestic financial market deepening and large savings, as suggested by the region's current account surpluses. Regional outward portfolio investment grew from 10 percent to 24 percent over the same period, but North America and advanced Europe remained the main destinations. However, the shares of intraregional portfolio investment are higher when Japan—the largest portfolio investment source and destination country in Asia—is excluded, reaching 30 percent to 40 percent in 2013.

The portion of inward portfolio investment originating from within the region is fairly homogeneous across Asian economies, with China and Japan being the main outliers (Figure 3.3). For China, the high intraregional share reflects transactions between the mainland and Hong Kong SAR. The share of intraregional inward portfolio investment in Asia is only about one-third the European Union intraregional share, reflecting the European Union's single market for financial services. On the other hand, Asia's intraregional inward portfolio investment is significantly higher than Latin America's. In regard to intraregional outward portfolio investment, shares differ considerably across Asian economies (Figure 3.4). But overall, shares are lower than in the European Union and higher than in Latin America.

Figure 3.3

Sources of Portfolio Inward Investment

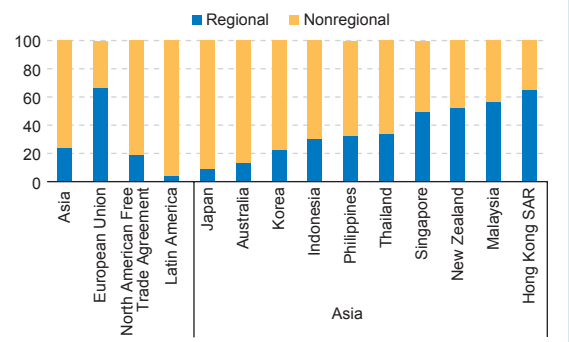
(Percent; end-2013)



Sources: IMF, Coordinated Portfolio Investment Survey database; and IMF staff calculations.

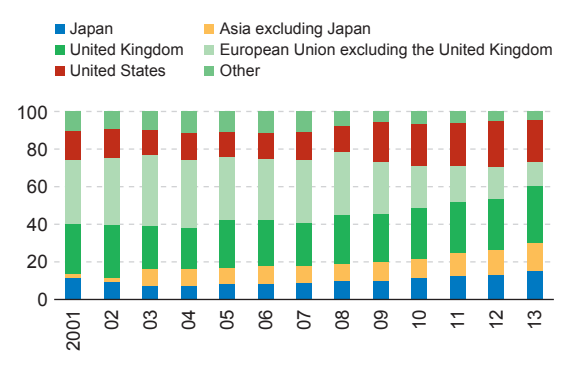
Hong Kong SAR and Singapore are two important financial centers, enhancing financial integration within Asia. Their foreign portfolio assets are about 270 percent and 200 percent of GDP, respectively, much higher than the average of only 20 percent in the rest of Asia. Hong Kong SAR

Figure 3.4
Destinations of Portfolio Outward Investment
(Percent; end-2013)



Sources: IMF, Coordinated Portfolio Investment Survey database; and IMF staff calculations.

Figure 3.5
Sources of Foreign Bank Claims on Asia
(Consolidated data; percent; end of period)



Sources: Bank for International Settlements; and IMF staff calculations.

is often referred to as the "gateway" to China, while Singapore is considered the regional financial center for Southeast Asia (Le Leslé and others 2014). The share of Singapore's foreign portfolio liabilities originating in Asia almost doubled from 13 percent in 2001 to 25 percent in 2013, with the share of portfolio assets in the rest of the region originating from Singapore increasing from 39 percent to 49 percent. For Hong Kong SAR, the rise in inward portfolio investment from Asia (excluding China) has been modest—from 15 percent to 18 percent—while portfolio assets from Hong Kong SAR to Asia (excluding China) have remained roughly stable at around 30 percent.

The portfolio asset data set discussed here includes only holdings of the private sector. Foreign portfolio assets in the official sector (central banks, sovereign wealth funds, state-owned entities) in Asia are large, given the size of Asia's official reserves. No information is available on how these assets are allocated, however, although it seems plausible that intraregional allocations have risen over time. Large public sector foreign asset holdings could be seen as a partial substitute for private holdings in terms of risk diversification and therefore may be a factor in Asia's more limited private cross-border portfolio holdings relative to those of other regions.

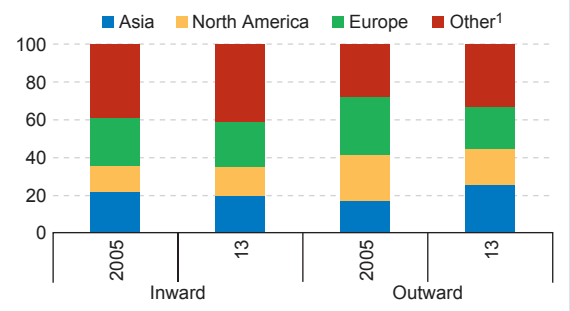
Bank Claims

Asia's cross-border banking linkages remain stronger between Asian economies and economies outside of Asia than among economies within the region, although intraregional foreign bank claims have increased. The share of foreign bank claims originating from within the region more than doubled, from 13 percent in 2001 to 30 percent in 2013, according to Bank for International Settlements (BIS) consolidated data (Figure 3.5).[5] This surge reflects the expansion of Japanese and Australian banks in the region, especially after the global financial crisis, when European banks retrenched (April 2015 *Global Financial Stability Report*, Chapter 2; Lam 2013). BIS locational data point to a similar degree of intraregional banking linkages.[6] According to this metric, about

[5] Cross-border bank claims on a consolidated basis include all contractual lending to local borrowers by head offices and all their branches and subsidiaries, net of interoffice transactions. For example, claims of Japanese bank branches and subsidiaries operating in Korea on local borrowers are counted as Japanese claims on Korea.

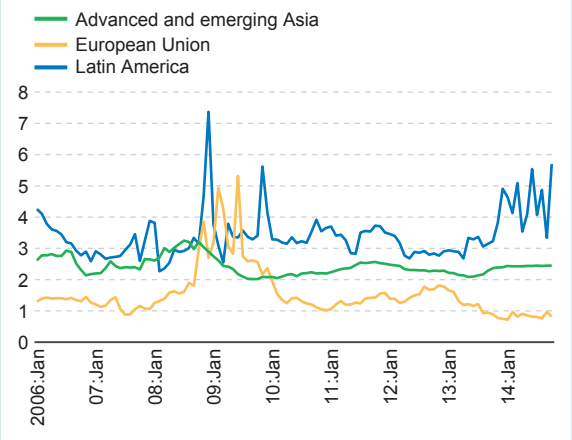
[6] Locational banking statistics categorize banks by location, consistent with the balance-of-payments residency principle. Data on locational cross-border banking claims were obtained from the BIS on a confidential basis.

Figure 3.6
Asia: Foreign Bank Claims
(Locational data; percent of total foreign bank claims to and from Asia)



Sources: Bank for International Settlements; and IMF staff calculations.
[1] Includes remaining regions, unallocated locations, and offshore centers.

Figure 3.7
Interest Rate Dispersion Comparison
(Percent)



Sources: CEIC Data Company Ltd.; Haver Analytics; and IMF staff calculations.
Note: Standard deviation of money market rates across countries in each region.

20 percent of foreign claims originated within the Asian region in 2013, and about 25 percent of Asia's foreign bank claims were directed to the rest of that region (Figure 3.6).

Convergence of Interest Rates

Price-based indicators of financial integration point to evidence similar to that revealed by quantity measures of cross-border portfolio holdings and bank claims.[7] Interest rate dispersion across Asian economies remains higher than that in the European Union, but lower than that in Latin America. Indeed, in Asia's emerging market and advanced economies, the standard deviation of money market rates has declined in recent years, following a temporary increase during the global financial crisis, suggesting some convergence in interest rates (Figure 3.7). Similarly, in Asia's emerging market and advanced economies, the standard deviation of 10-year government bond yields has nearly halved since 2001.

Understanding the Drag on Deeper Regional Financial Integration: The Role of Home Bias

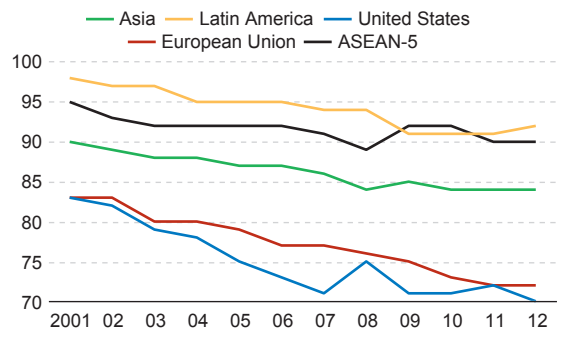
What accounts for the rather slow pace of regional financial integration in Asia, and why does it lag considerably behind trade integration? One explanation is that most of Asia's private financial investment remains within the domestic economy, rather than going abroad.[8] In fact, on average, Asian investors hold only 13 percent of their total equity portfolio in foreign markets. In contrast, European Union investors hold about 31 percent of their equity portfolio investment abroad and Latin American investors about 22 percent.

The index of home bias in equity markets provides a measure of this preference among Asian investors. The index measures the gap between the share of portfolio investment held in the domestic market and the benchmark share predicted by the

[7] The literature uses a number of price-based indicators of financial integration, including cross-country standard deviation of money market and bond yields (Kim and Lee 2008) and stock return dispersion. For a survey and empirical evidence on Asia, see Kang-por Fung, Tam, and Yu (2008).

[8] Nevertheless, foreign asset accumulation by central banks is an important counterweight to private sector home bias.

Figure 3.8
Home Bias Index across Regions



Sources: IMF Coordinated Portfolio Investment Survey database; and IMF staff calculations.
Note: ASEAN-5 = Indonesia, Malaysia, the Philippines, Singapore, and Thailand. The index range is from 0 to 100, with a higher number indicating greater home bias.

size of the domestic market capitalization in the world market.[9]

The average home bias in Asia—particularly in the ASEAN-5 economies (Indonesia, Malaysia, the Philippines, Singapore, Thailand)—according to the index is higher than that in the European Union and the United States, though it is lower than that in Latin America (Figure 3.8). Overall, there has been a clear downward trend in the home bias across all regions for much of the period since 2000, reflecting increased financial globalization. However, this trend decline stalled in most regions after the global financial crisis, when international capital flows retrenched. Only for European Union members has home bias continued to decline since the global financial crisis, as domestic investors have moved out of their domestic stock markets amid market corrections and significant uncertainties over the economic and financial outlook.

Why is the home bias in equities larger in certain economies, including some in Asia? Empirical analysis of a panel of 50 countries from different regions indicates that the home bias is greater in economies with lower economic and financial development and economies in which foreign capital flow restrictions are more pronounced. In Asia, in particular, the home bias index is even higher than that predicted by the level of economic and financial development, and capital account openness—with the unexplained residual being almost twice as high as the European Union's. This points to the important role of other factors in contributing to Asian economies' observed low equity investment abroad, including within the region. To some extent, the home bias may reflect foreign companies' decisions to be listed as local firms for buying financial assets to avoid often-higher transaction costs and income taxes on nonresidents.

Drivers of Financial Integration

To better understand the main factors driving cross-border financial integration between two countries, a gravity model is estimated on a large sample of source and destination countries worldwide, using annual data over 2001–12.[10] The dependent variable is either the source country's portfolio asset holdings or its bank claims in the destination country (using both consolidated and locational data on bank claims).[11]

Explanatory variables comprise measures of market size, a set of factors affecting expected returns on asset holdings (such as interest differential), GDP per capita, indicators of financial market sophistication, and proxies for transaction costs and frictions on financial asset trading. The latter include the distance between the two

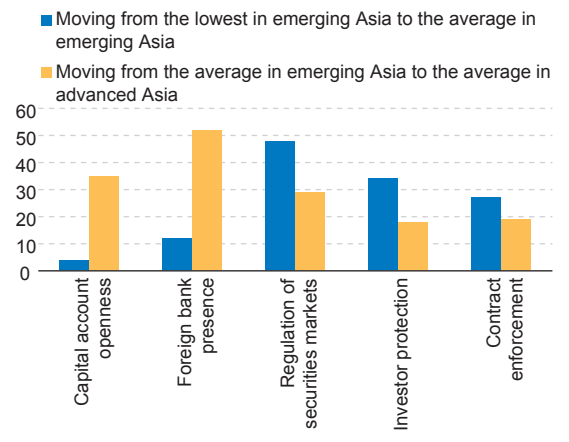
[9] The home bias index ranges from 0 to 100, with a higher number indicating greater home bias.

[10] Other empirical studies using gravity models to assess bilateral cross-border financial flows in Asia include Eichengreen and Park (2004), Garcia-Herrero, Yang, and Wooldridge (2008), and Lane (2011).

[11] Sample size depends on data availability. In regressions on portfolio asset holdings, the data set includes 63 source and 140 destination countries, with over 330 intra-Asia pairs. In regressions with locational cross-border banking claims, the sample covers 140 source and destination countries, with 273 intra-Asia pairs. When consolidated banking statistics are used, the data sample is somewhat smaller, with a total of over 3,000 pairs, 90 of which are intra-Asia. Portfolio asset holdings and bank claims are expressed in millions of U.S. dollars.

countries, absence of a common language, and explicit restrictions on foreign asset holdings.[12] Explanatory variables also include bilateral differences in regulatory and institutional quality, such as differences in securities market regulation, the degree of investor protection, the quality of the insolvency law, and auditing and accounting standards.[13] The model also tests whether a strong foreign bank presence in a country—or limited restrictions on foreign bank penetration—supports financial integration, by reducing informational asymmetry and costs in cross-border financial transactions.[14] Tests are also conducted to determine whether there is an additional intra-Asian effect.[15]

Figure 3.9
Illustrative Impact of Explanatory Variables on Financial Integration
(Percent)



Sources: Chinn and Ito (2006); Claessens and van Horen (2014); World Economic Forum, *Global Competitiveness Report* (2014–15); World Bank, Doing Business database; and IMF staff calculations.
Note: Estimated increase in bilateral portfolio investments when a respective explanatory variable in the destination country increases from a lower to a higher level as specified (percentage change).

The estimations point to the following:

- Bilateral financial integration increases with the depth and sophistication of financial markets of both the source and destination countries.
- Bilateral financial integration is stronger between countries with greater capital account openness—that is, with fewer restrictions on foreign capital transactions—as measured by the Chinn-Ito (2006) index.[16] To illustrate the quantitative impact of this factor, consider a case in which the destination country raises its capital account openness from the Asian emerging market average to the average for Asian advanced economies, all other things being equal. This change alone would lift cross-border portfolio investment stock by 30 percent (Figure 3.9).
- Trade integration buttresses financial integration, possibly because financial flows are

[12] As shown in Portes and Rey (2005), informational asymmetries are proxied well by the distance between the two countries and the absence of a common language, because these factors hinder the interaction among economic agents and, hence, the exchange of knowledge about market structures, corporate culture, and other information that may be important for investment decisions. Time zone difference—as measured by difference in longitude—was not found to be statistically significant.

[13] Indicators of financial regulations include the financial and banking regulation index from the International Institute for Management Development's World Competitiveness Survey and the regulation of securities exchange index from the World Economic Forum's *Global Competitiveness Report*. Measures of accounting standards, auditing standards, and capital regulation are constructed from the Bank Regulation and Supervision Survey conducted by the World Bank. Indicators of strength of bankruptcy law and credit reporting systems are from the World Bank's Doing Business database.

[14] All equations include time dummies. To check for robustness, different econometric techniques are used, including pooled ordinary least squares, destination country fixed effects, country pair fixed effects, and the Hausman-Taylor estimator.

[15] For this purpose, intraregional dummy variables are added to the baseline specification. For example, the Asia-intraregional dummy takes on the value of 1 if both source and destination countries are Asian and 0 otherwise. The estimated coefficient on this variable measures the difference in the degrees of integration between two countries from the same region, compared to the typical degree of integration between any two countries from different regions.

[16] Furthermore, estimates suggest that regulatory impediments to capital outflows have a larger adverse impact on cross-border investment than do restrictions on capital inflows.

a complement to trade in goods and services, which could also help alleviate informational asymmetries and, hence, transaction costs. An increase of 10 percent in goods trade between two countries is found to raise bilateral portfolio holdings by 4 percent to 7 percent.

- Differences in financial regulation between countries are important determinants of financial integration, as investors may be reluctant to carry out financial transactions with entities in countries whose regulations and institutions are very different from their own. For example, consider a case in which the source country scores at the average level of the securities market regulation metric for Asian emerging market economies and the destination country has the weakest metric among those economies. If the destination country upgraded its regulations to close the gap with the source country, then cross-border portfolio investments between the two could increase by more than 40 percent.
- There are indications that differences in accounting standards, auditing standards, capital regulation, and strength of bankruptcy law and credit reporting systems between source and destination countries discourage bilateral banking flows. For example, estimates suggest that closing the gap in accounting standards between the two Asian countries that score the lowest and highest in the sample on measures of accounting standards could help boost their bilateral bank claims by over 15 percent.
- Foreign bank presence in a country—as measured by the total amount of foreign assets or number of foreign financial institutions in the domestic system—supports cross-border portfolio investment. Besides this, restrictions on foreign ownership of domestic banks discourage cross-border banking flows. Estimates from this chapter's research suggest that a 10 percent increase in foreign banks' asset share in a host country's domestic banking sector is associated with roughly a 20 percent increase in cross-border portfolio investments in the host country.
- Cross-border portfolio investment within Asia does not appear to be driven by a risk diversification motive, as bilateral portfolio investment is strong between economies with synchronized business cycles. However, there is evidence of search for yield, in that the return differential is a significant factor in driving bilateral portfolio investment.
- The extent of financial integration within Asia is heterogeneous, with higher bilateral cross-border portfolio holdings among ASEAN economies than between economies in the rest of the region. Indeed, an intraregional dummy for ASEAN economies has a positive and statistically significant sign, but the dummy for Asian economies outside of ASEAN is negative and nonsignificant.

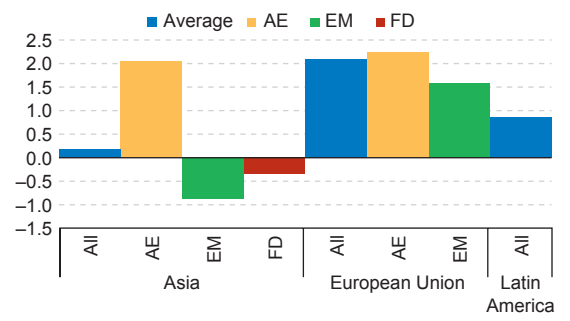
Implications for Asia

How does Asia score on the variables that are empirically found to have a significant impact on cross-border portfolio and banking transactions? And hence, what are the implications for Asian economies wanting to step up regional financial integration?

A finding of the gravity model estimation is that fewer restrictions on cross-border capital movements support financial integration. In this respect, Asia's more limited capital account openness compared to other regions, especially in emerging market, frontier, and developing economies, could be an obstacle to further integration, including within the region (Figure 3.10).

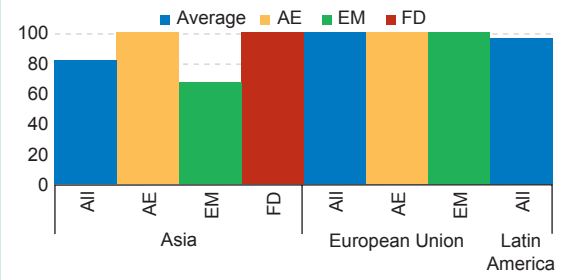
The analysis also suggests that foreign bank penetration could help enhance bilateral financial transactions. From this point of view, statutory restrictions on foreign ownership of equity in the banking sector appear to be particularly prominent in parts of Asia, especially emerging markets (Figure 3.11). Indeed, foreign bank presence is quite limited in a number of Asian countries—although some exceptions stand out, and the share of regional assets more than doubled after the

Figure 3.10
Capital Account Openness Index
(Average across countries in each region)



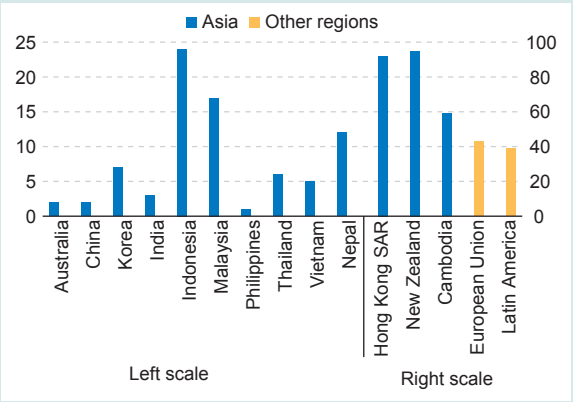
Sources: Chinn and Ito (2006); and IMF staff calculations.
Note: AE = advanced economies; EM = emerging markets; FD = frontier and developing economies. Data as of 2012.

Figure 3.11
Allowed Foreign Ownership of Equity in the Banking Sector
(100 = full foreign ownership allowed; average across countries in each region)



Sources: World Bank, Investing Across Borders database; and IMF staff calculations.
Note: AE = advanced economies; EM = emerging markets; FD = frontier and developing economies. Allowed foreign ownership of equity in new investment projects (greenfield foreign direct investment) and allowed foreign acquisition of shares in existing companies (mergers and acquisitions). Data are latest available.

Figure 3.12
Foreign Bank Penetration
(Foreign bank assets in percent of total bank assets)



Sources: Claessens and van Horen (2014); and IMF staff calculations.
Note: Data as of 2012.

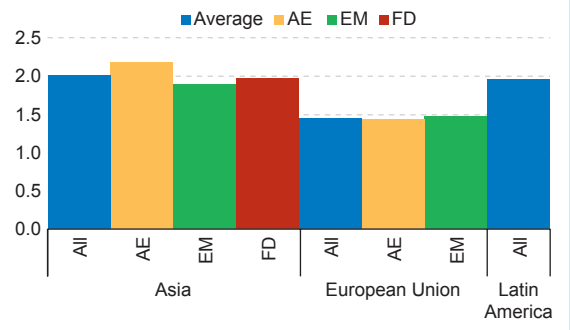
global financial crisis (Figure 3.12).[17] Hence, easing limits on foreign ownership of equity in banks could support financial integration. However, a stronger foreign bank presence could also weaken a country's monetary policy independence by reducing the pass-through of domestic monetary policies to credit activity (see Box 1.13).

More specifically, the analysis also has some implications for intraregional financial integration. Evidence of complementarity between trade and financial integration suggests that advancing regional trade integration is associated with deeper financial linkages. Several initiatives are already under way in Asia, including regional free trade agreements such as the Regional Comprehensive Economic Partnership involving ASEAN and Australia, China, India, Japan, Korea, and New Zealand. Further progress on these initiatives and toward the goal of establishing the ASEAN Economic Community could help financial and trade integration.

Sizable regulatory differences remain within Asia, which may be hindering further regional financial integration. More specifically, differences in investor protection, the ability to resolve commercial disputes, and bankruptcy procedures appear more pronounced within Asia than in other regions (Figures 3.13 to 3.15). Policymakers in Asia pursuing deeper financial integration may therefore want to consider further harmonization in these areas.

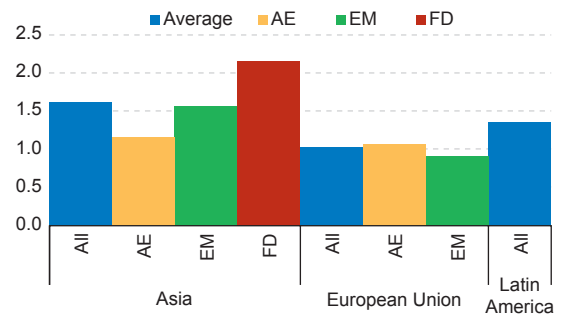
[17] The share of regional bank assets in Asian banking systems increased from about 10 percent in the mid-2000s, before the global financial crisis, to an average of 20 percent in 2008–13. Conversely, the share of domestic bank assets declined from 84 percent to 73 percent. These changes partly reflect the recent internationalization of Chinese banks (April 2015 *Global Financial Stability Report*).

Figure 3.13
Difference in Investor Protection Index
(Average across countries in each region)



Sources: World Bank, Doing Business database; and IMF staff calculations.
Note: AE = advanced economies; EM = emerging markets; FD = frontier and developing economies. Data are latest available.

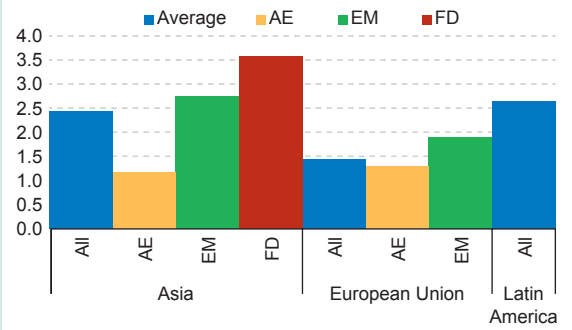
Figure 3.14
Difference in Contract Enforcement Index
(Average across countries in each region)



Sources: World Bank, Doing Business database; and IMF staff calculations.
Note: AE = advanced economies; EM = emerging markets; FD = frontier and developing economies. Data as of 2012.

Since financial linkages between countries and the extent of home bias depend on the depth and sophistication of financial markets, initiatives to foster domestic financial deepening would promote further integration. However, developing financial markets would also raise challenges, requiring strong regulatory and supervisory frameworks to minimize financial stability risks.

Figure 3.15
Difference in Resolving Insolvency Index
(Average across countries in each region)



Sources: World Bank, Doing Business database; and IMF staff calculations.
Note: AE = advanced economies; EM = emerging markets; FD = frontier and developing economies. Data are latest available.

Allowing greater participation of foreign investors in domestic markets would also support financial integration, but it would increase asset price sensitivity to global and regional financial conditions. In addition, it would reduce monetary policy independence, and economies could become more prone to capital flow volatility, which is often associated with asset price cycles. Macroeconomic policies, including monetary, fiscal, and exchange rate management, would need to play a key role in managing the macroeconomic and financial stability risks of volatile capital flows.

Appropriate macroprudential policies could also be used to boost resilience. Regional safety nets, including the Chiang Mai Initiative Multilateralization, would help mitigate the impact of capital flow volatility. Stronger international policy cooperation and cross-border supervision would be needed to mitigate stability risks from deeper foreign bank presence.

Box 3.1

The Benefits and Risks of Further Regional Financial Integration in Asia

Greater financial integration can benefit countries substantially by improving the allocation of savings and investment across regions, allowing more international risk sharing and promotion of financial sector competitiveness. But it may also heighten a country's vulnerability to contagion, reversals of capital flows, stronger output comovements across countries, and higher growth volatility. The gaps in countries' financial and institutional infrastructure magnify the risks of deeper financial integration (IMF 2007, 2012).

Benefits

By reducing obstacles to financial transactions in foreign markets, financial integration should allow investors to allocate their funds to the most efficient and productive projects. In Asia, greater regional financial integration in particular could help relocate savings from countries with aging populations toward fast-growing economies with large infrastructure investment needs (Ding, Lam, and Peiris 2014).[1]

Financial integration is also expected to promote competition, and hence efficiency, among financial intermediaries, reducing intermediation costs. This greater efficiency can stimulate demand for financial services and enhance participation from both local and foreign investors, contributing to financial deepening. Furthermore, the integration process typically involves improvements in financial regulation to bring it in line with best practice, which, in turn, can foster financial development by reducing informational asymmetry and supporting investor participation (Giannetti and others 2002). Financial development could then support growth (Levine 1997).

Increased efficiency in financial intermediation, improvements in regulation, and a larger availability of funds from financial integration are also expected to result in lower borrowers' costs for both the private and public sector. Tighter sovereign and corporate spreads could therefore be an important channel through which deeper financial integration and development could support infrastructure financing in Asian emerging economies (Ding, Lam, and Peiris 2014). In Asia, there is also the perception that regional investors could provide a more stable basis for funds than investors from outside the region.

Economic theory suggests that financial integration also gives consumers more opportunities to share risk and to smooth consumption intertemporally. Indeed, financial openness allows residents to enjoy relatively stable consumption streams despite fluctuations in domestic output and returns, as it enables residents to hold financial assets in other countries with different return patterns than the domestic economy. A simple way to measure potential risk-sharing gains from financial integration with a group of other countries is to compare an individual country's consumption volatility with the volatility of group-wide output. If a country's individual consumption volatility is much higher than it would be under full financial integration within the group, then potential risk-sharing gains are relatively large (IMF 2007).

The potential risk-sharing benefits—as measured by a reduction in consumption volatility—from full financial integration within Asia are large: the standard deviation of Asia's output growth is 1.7 percentage points, much lower than the median standard deviation of consumption growth for individual countries (3.7 percentage points—Table 3.1.1). Similarly, the potential risk-pooling benefits for ASEAN-3 economies (China, Japan, Korea) are also substantial. For comparison, benefits from further risk sharing in the European Union and euro area are much smaller, because these regions are already highly integrated.

Prepared by Edda Zoli.

[1] The most comprehensive estimate of Asia's total infrastructure investment needs, in Asian Development Bank (2009), put them at $8 trillion over 10 years.

(*continued*)

Box 3.1 *(continued)*

Table 3.1.1 Potential Gains from Risk Sharing Among Countries (*percent*)

	Median Standard Deviation of Consumption Growth in Individual Country	Standard Deviation of Income Growth in Whole Group
Asia	3.7	1.7
ASEAN+3	3.7	1.8
European Union	2.7	1.8
Euro area	2.4	1.8
Latin America	3.5	1.9

Sources: World Bank, World Development Indicators database; and IMF staff calculations.
Note: ASEAN+3 comprises Cambodia, Indonesia, Lao P.D.R., Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam, plus China, Japan, and Korea.

Risks

Deeper regional financial integration could amplify shock propagation and synchronization in the region, threatening financial stability. Indeed, the vast literature on contagion stresses how financial shocks can be spread through financial linkages, via different channels (Forbes 2012). For example, a shock to one country's financial sector (such as a sharp increase in nonperforming loans or a deposit run) can cause banks to reduce the supply of credit to other economies as well. Also, idiosyncratic shocks to the value of investors' portfolios in one country may force them to sell assets in other countries to meet margin calls or cash requirements.

Financial integration can then result in stronger output comovements across countries, with the transmission of output growth slowdowns or contractions in one economy across borders. In fact, empirical studies find that financial integration increases business cycle synchronization during crises. But deeper financial linkages are found to induce greater output divergence during tranquil periods, since, with financial integration, capital can move to where it is most productive (Duval and others 2014; Kalemli-Ozcan, Papaioannou, and Perri 2013; Kalemli-Ozcan, Papaioannou, and Peydro 2013; October 2013 *World Economic Outlook*). The impact of increased bilateral cross-border bank claims on output comovements can be fairly large. Estimates based on 63 countries suggest that if banking flows between two countries were to move from the 25th to the 75th percentile of the distribution in the sample—which is similar to the increase in bilateral cross-border bank claims that Singapore and India have experienced in the past 10 years, for instance—the correlation of the growth rate between the two countries would increase by some 0.25 during crises. This is compared with a correlation of –0.02 during normal times (Duval and others 2014).

Deeper financial integration is generally more beneficial and less risky if countries have reached certain levels of financial and institutional development (IMF 2012). Evidence also suggests that, for countries with relatively higher institutional quality, well-developed domestic financial systems, and sound macroeconomic policy frameworks, significantly higher macroeconomic volatility has not accompanied greater integration. For countries without those conditions in place, volatility has tended to increase with greater openness (IMF 2007).

Box 3.2

Does Financial Integration Enhance Financial Inclusion?

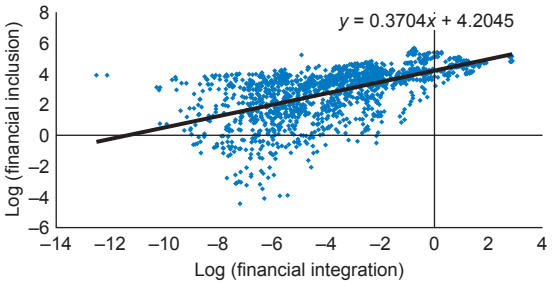
Can deeper financial integration enhance financial inclusion—that is, improve access to financial services? By fostering credit and capital market development and boosting competition and efficiency in financial intermediation, financial integration could improve access to financial services. Indeed, financial inclusion and cross-border banking integration—as measured by the size of cross-border bank assets and liabilities in percent of GDP—appear to be correlated (Figure 3.2.1).[1]

To assess whether there is a causal relationship between cross-border banking integration and financial inclusion, a regression model is estimated on a panel of 150 countries over 2001–12, using alternative measures of financial inclusion as the dependent variable. The explanatory variables include lagged cross-border bank claims and several controls, namely, indicators of quality of financial infrastructure, measures of financial depth (such as the bank-credit-to-GDP ratio), banks' stability, banking sector concentration and competition (the Herfindahl index and Boone indicator, for example), and level of education as a proxy for financial literacy.[2]

The results indicate that, in middle- and high-income countries, cross-border banking integration has a positive effect on financial inclusion, even after other factors are controlled for (Figure 3.2.2). On the other hand, banking integration is not a significant variable in explaining financial inclusion in a larger sample that also includes low-income countries, possibly because the increase in banking integration in those countries during the sample period considered was relatively small. This finding is also consistent with the possibility of threshold effects, with the impact

Figure 3.2.1

Financial Inclusion and Cross-Border Banking Integration

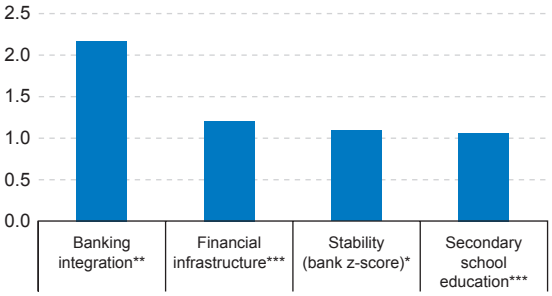


Sources: Bank for International Settlements, International Banking Statistics database; IMF, Financial Access database; World Bank, Global Financial Development database; and IMF staff calculations.
Note: Financial inclusion is measured by automated teller machines/100,000 adults.

Figure 3.2.2

Illustrative Impact on Financial Inclusion of Moving from 25th Percentile to 75th Percentile in Explanatory Variable

(Increase in ATMs/100,000 adults)



Source: IMF staff estimates.
Note: ATM = automated teller machine. Financial inclusion is measured by ATMs/100,000 adults. Median ATMs/100,000 adults is about 16 ATMs/100,000 in this sample, which includes middle- and high-income economies only. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Prepared by Dulani Seneviratne.

[1] Several alternative indicators of financial inclusion (such as number of automated teller machines per capita, bank accounts per capita, and bank branches per capita) point to the same evidence. This box focuses on the number of automated teller machines per capita as an indicator of financial inclusion, given the better country coverage, consistent with the World Bank's *Global Financial Development Report on Financial Inclusion*. However, the findings presented here are confirmed when other indicators of financial inclusion are used instead.

[2] A country's cross-border bank claims are measured using two different approaches: the country's cross-border banking assets plus liabilities in percent of GDP, and as a share of the world's total cross-border banking assets and liabilities. Data are from the Bank for International Settlements' locational statistics database. All controls are entered with one lag. Time and country fixed effects are also added.

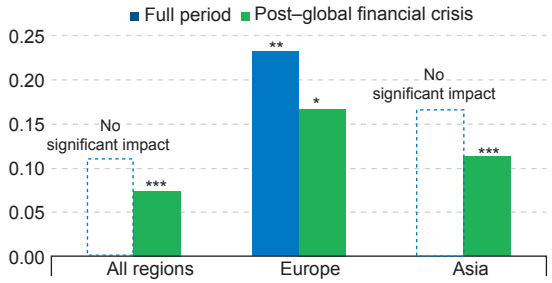
(*continued*)

Box 3.2 *(continued)*

of integration on inclusion becoming statistically significant only once financial sector development is above a certain level.[3]

While the results suggest a positive impact of deeper financial integration with the rest of the world on financial inclusion, does *regional* integration also improve individual access to financial services? The effect of regional cross-border banking integration on financial inclusion is assessed using a similar framework by regressing financial inclusion on *regional* banking integration—measured by bilateral banking claims relative to other countries in the same region.[4] Controls similar to those in the baseline panel regression model described earlier are included as explanatory variables in addition to regional banking integration. The results suggest that:

Figure 3.2.3
Effect of Regional Banking Integration on Financial Inclusion



Source: IMF staff estimates.
Note: Estimating coefficients of regressing financial inclusion (automated teller machines/100,000 adults) over banking integration within the region after controlling for other factors. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

- For the whole sample, *regional* banking integration is not a statistically significant variable in explaining financial inclusion over the entire period 2001–12, when other factors affecting financial inclusion are controlled for (Figure 3.2.3).
- However, regional financial integration is a statistically significant determinant of financial inclusion in Europe, in addition to financial deepening and other control variables.
- Furthermore, in Asia, regional cross-border banking integration has become a significant determinant of financial inclusion since the global financial crisis, with other determinants controlled for.[5] This suggests that the increase in regional cross-border banking integration and in regional banks since the crisis may have increased the availability of banking services to segments of the population. One reason could be that, as Asian economies' financial development increases, they reach the thresholds for financial inclusion, in which the impact of integration on inclusion becomes significant.

[3] Indeed, the interaction term between financial integration, financial development, and level of education is positive and statistically significant.
[4] The sample includes only middle- and high-income countries based on availability of Bank for International Settlements confidential location data. The impact of regional financial integration on inclusion by region, and in the post–global-financial-crisis period, is also assessed by introducing interaction terms with relevant regional and time dummy variables. As a robustness check, regressions are performed on the subsamples of Europe and Asia only.
[5] Similarly, using microlevel data, Beck (2014) finds that the increasing importance of regional foreign banks in Africa over 2006–09 helps explain improvements in financial inclusion in Africa over that period.

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