

### 3. Does Growing Regional Integration Make Asian Economies Move More in Sync?

#### Introduction and Main Findings

In recent decades, especially during the 1990s, trade integration within Asia has proceeded faster than in other regions. In value-added terms, intraregional trade grew on average by over 10 percent a year from 1990 to 2012, twice the pace seen outside of Asia. While Asia's overall trade openness today does not particularly stand out compared to other regions—partly reflecting the presence of several large, less open economies—the intensity of intraregional trade does stand out, especially within ASEAN. Concomitantly, financial integration within the region—as well as between the region and the rest of the world—has started to catch up, although it still lags behind trade integration.

Have these increases in trade and financial integration strengthened the propagation of growth shocks between regional partners, leading Asian economies to move more in lockstep? What role is China playing in driving growth spillovers and thereby business cycle synchronization (BCS) in the region? Will the regional integration agenda and a bigger China further increase the transmission of shocks and BCS in the future? These questions matter for understanding the likelihood and impact of synchronized growth slowdowns across the region and determining what policies are best for preventing and responding to them. Based on a unique dataset covering value-added in goods and services traded over the past two decades, this chapter takes a fresh look at these issues. The main findings are the following:

- Not surprisingly, the region's economies are most synchronized during major crises. Specifically, GDP growth co-movement jumped during the 1997–98 crisis and again (to a lesser extent) during the 2008–09 global

financial crisis. However, even excluding these exceptional periods, the business cycle in the region's economies has become steadily more synchronized over the past two decades.

- Bilateral trade intensity *in value-added terms*—but *not* bilateral *gross* trade—has a significant effect on BCS, likely reflecting the propagation of shocks through the trade channel. The greater the value-added traded between Asian economies, the greater their co-movement, *all else equal*. Over the past two decades, the increase in value-added in trade has accounted for around one-quarter of the increase in synchronization in Asia.
- Countries that have significant intra-industry trade or that export similar goods also see greater cyclical synchronization. This perhaps reflects the similarity in industrial structures across such countries and the importance of industry-specific shocks in driving the cycle. The largest ASEAN economies stand out along these two dimensions.
- Financial integration magnifies the impact on BCS of large adverse global shocks such as the global financial crisis. By contrast, in normal times, greater financial integration tends to lower the correlation of the cycle across countries, possibly by facilitating international reallocation of capital when a shock hits one country. However, this is less of a factor in Asia, where cross-border flows are relatively smaller.
- Spillovers from China's growth shocks are about twice as large for Asia as for non-Asia. This makes the rest of Asia more vulnerable to any sharp slowdown in China, and means that China is likely to be an increasingly important factor in driving regional cycles as Asia's dependence on Chinese final demand (in *value-added* terms) continues to grow.

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The main authors are Kevin Cheng and Romain Duval. The analysis relies on Duval and others (2014).

- Going forward, insofar as trade and financial integration rise, so will BCS. Regional trade integration—which by most measures stopped growing over the last decade—will only increase insofar as policymakers show the political will to reduce trade barriers in sensitive areas, including services. But if this happens, BCS is likely to rise further. With the increasing importance of final demand from China for other Asian economies, growth shocks originating from China will become a growing source of spillovers and co-movement across the region, while shocks from advanced economies will matter less. Greater regional financial integration will have a more ambiguous effect on BCS, but it could amplify spillovers in crisis periods.
- The main challenge for policymakers will be to reap the substantial growth benefits from greater regional integration while minimizing the potential vulnerabilities arising from higher BCS, particularly the risk of larger and more synchronized falls in incomes during crises. Policies to strengthen individual economies' resilience to shocks, as well as broad financial safety nets, can play a role in this regard.

## Is Activity Moving More in Sync in Asia?

The main characteristics of business cycle co-movement in Asia are illustrated in Figure 3.1. Key patterns may be summarized as follows:

- BCS spikes during major crises. Not surprisingly, for Asia, the crisis of the late 1990s had an even bigger effect than the global financial crisis (top left panel).<sup>1</sup>
- Excluding crisis periods, BCS is typically much lower, but it has nonetheless been rising steadily

<sup>1</sup> All calculations and regressions in this chapter are based on annual data for 63 countries, including 34 advanced economies (7 of them in Asia) and 29 emerging market economies (8 of them in Asia).

around the world over the past two decades. This increase has been particularly large in Asia and Latin America, although synchronization in both regions is still less than between euro area economies during the 2000s.

- Within Asia, BCS appears to be particularly high among ASEAN-5 economies (Indonesia, Malaysia, the Philippines, Singapore, and Thailand). These findings are robust to alternative approaches for measuring BCS, that is, to using either the quasi-instantaneous correlation proposed in IMF (2013d)<sup>2</sup> or the standard correlation coefficient (top right and bottom left panels).
- China's output co-movements with the rest of Asia have increased, but Asian economies have continued to co-move more with Japan—whose cycle has been small in amplitude, however—and the United States (bottom right panel). This likely reflects the continued importance of global factors in driving business cycles across the region (see Duval and others, 2014) and, as regards ASEAN's co-movement with Japan, the impact of the 2011 earthquake and tsunami. Among all Asian economies studied here, India has the lowest degree of output co-movement with its regional peers, suggesting that its cyclical fluctuations are more driven by domestic shocks.

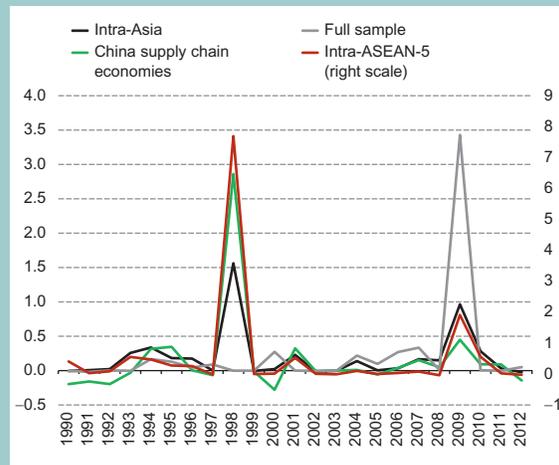
What accounts for these patterns, in particular for the trend rise in BCS in Asia, its high level in ASEAN, and the spikes in BCS during crises? The remainder of this chapter explores the role of trade integration and also examines the impact of financial integration and macroeconomic policy synchronization.

<sup>2</sup> Unlike the standard (Pearson) correlation coefficient, which has to be computed over a time interval, the quasi-correlation can be calculated at any point in time. For a given pair of countries  $i$  and  $j$ , it is equal to the product of deviations of growth rates in  $i$  and  $j$  from their sample averages, divided by the product of standard deviations of growth rates in  $i$  and  $j$  over the sample. For details, see Duval and others (2014).

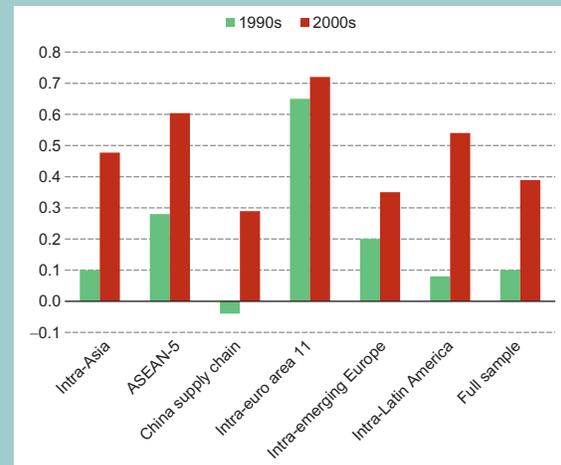
### 3. DOES GROWING REGIONAL INTEGRATION MAKE ASIAN ECONOMIES MOVE MORE IN SYNC?

Figure 3.1

#### Median Quasi-Correlations by Region<sup>1</sup>

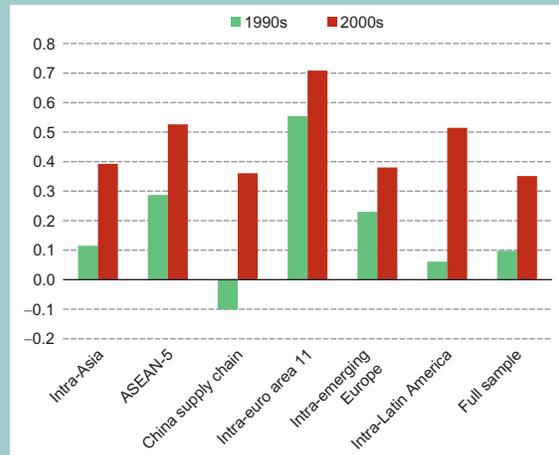


#### Quasi-Correlations by Region<sup>1,2</sup> (Excluding crisis periods)

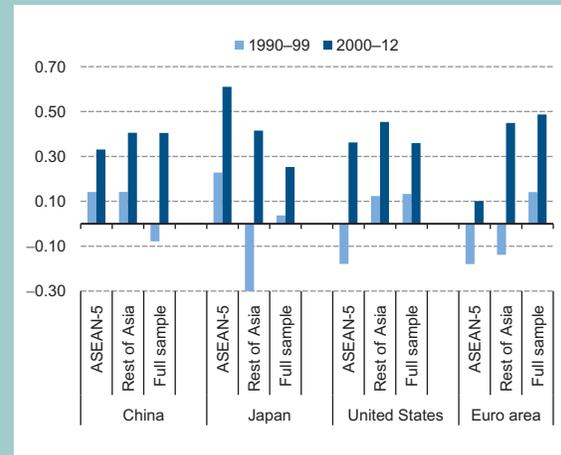


#### Bilateral Pearson Growth Correlations by Region<sup>1,2</sup>

(Excluding crisis periods)



#### Average Bilateral Pearson Growth Correlations (Excluding crisis periods)



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

<sup>1</sup> China supply chain economies include China, Korea, Malaysia, the Philippines, Taiwan Province of China, and Thailand. They are identified based on the intensity of their trade linkages (in value-added terms). Unlike the usual (Pearson) correlation coefficient, which has to be computed over a time interval, the quasi-correlation can be calculated at any point in time. For a given pair of countries  $i$  and  $j$ , it is equal to the product of deviations of growth rates in  $i$  and  $j$  from their sample averages, divided by the product of standard deviations of growth rates in  $i$  and  $j$  over the sample. For details, see Duval and others (2014). Crisis periods are years 1998 and 2009.

<sup>2</sup> Euro area includes the 11 countries that adopted the euro in 1999.

## The Role of Trade Integration

Both the intensity and the type of trade between economies can make them co-move, either by propagating shocks from one to another or by making the same shocks commonly shared:

- First, greater trade linkages provide more conduits for changing demand conditions in

one country to spill over to others, potentially with a complex series of amplifying feedback loops. The main novelty of this chapter is to focus on trade in value-added. This is a better measure of interdependence between trading partners than gross trade, on two grounds: (1) it nets out two-way trade in intermediate inputs, which otherwise would overstate trade dependence between partners; (2) it includes

*indirect* trade linkages *via* third countries (for example, value-added exported by country *i* to country *k* for use as intermediate inputs into goods that are then re-exported to country *j*), which if not accounted for would understate trade dependence between partners (*i* and *j*).

- Second, where there is significant vertical trade integration (trade in intermediate goods used as inputs into production processes) between two economies and a lack of substitutability of inputs, this can create a propagation mechanism that transmits shocks up and down the vertical supply chain, even in the absence of a shock to final demand, for example in the wake of the earthquake and tsunami in Japan in 2011.
- Finally, a greater amount of intra-industry trade (bilateral trade of similar goods) and similar trade specialization (same structure of exports to all trading partners) between two countries should be an indication that they have a similar industrial structure.<sup>3</sup> Therefore, if they are hit predominantly by industry-specific shocks, they should show greater co-movement.

The above findings suggest that, depending on the nature of shocks, four dimensions of trade can influence BCS, namely: trade intensity, the degree of vertical integration, the prevalence of intra-industry trade, and the similarity of trade specialization between two economies. These factors show the following key changes over the past two decades.

**Trade intensity.** Trade openness has increased more rapidly in Asia than elsewhere since 1990, and

<sup>3</sup> While the similarity of trade specialization and the intensity of intra-industry trade would seem to bear a close relationship *a priori*—as both are indicative of similar industry structures—this is not the case in the data since for any given country pair the time series correlation between these two variables is typically low. This is because two countries can export similar goods and services to third countries (high-trade specialization similarity) without necessarily exporting these goods and services to each other (low intra-industry trade), for instance.

so has intraregional trade, although these trends have come to a halt since the mid-2000s (Figure 3.2). This is the case even after netting out trade in intermediate inputs by using value-added trade data—which take into account the increasingly important supply chain networks across the globe and the region (see, for example, IMF, 2011a)—rather than gross trade data.<sup>4</sup>

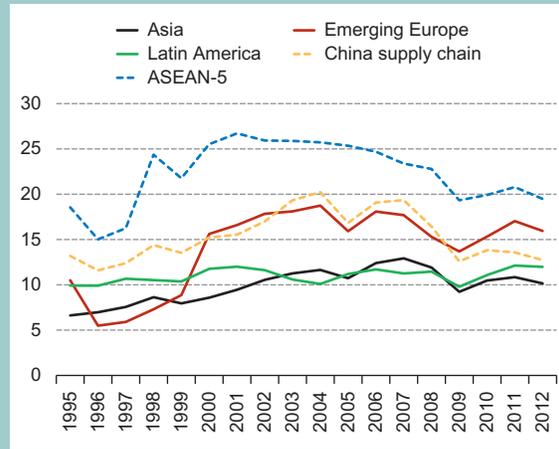
**Vertical integration.** Vertical integration has also increased more in Asia than elsewhere, with China playing a pivotal role. The share of foreign value-added embedded in total exports has generally increased in Asia economies, particularly in China and in East Asia reflecting the “China supply chain” network (Figure 3.3). Value-added to/from China has increased rapidly across Asian economies, while that to/from Japan has declined (Figure 3.4). This reflects both China’s growth in size (and thus its greater absorption of any given country’s exports) and its move up the value chain (and thus its growing market share in global trade for intermediate goods). Within ASEAN-5, vertical integration with partners is also significant although it has not increased much. Furthermore, the nature of integration with partners differs between China and Japan, with China specializing comparatively more in downstream activities (such as assembling, even though China is now increasingly moving up the value chain) and Japan specializing in upstream activities (providing various intermediate goods as inputs) (Figure 3.5). Finally, although the United States and the EU remain by far the largest final consumers of Asia’s supply chain products, the importance of final demand coming from China has increased rapidly over the past two decades (Figure 3.6).

<sup>4</sup> These data build on the recent joint initiative by the Organization for Economic Cooperation and Development (OECD) and the World Trade Organization (WTO) on trade in value added in goods and services. They are interpolated and extrapolated up to 2012 using an approach described in Duval and others (2014), where a detailed definition of each of the trade and other variables presented in this chapter can also be found.

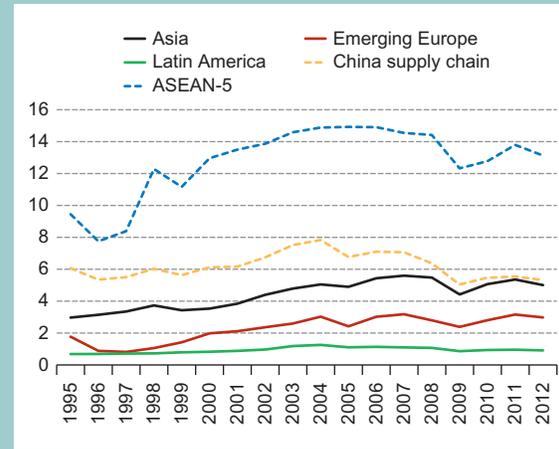
### 3. DOES GROWING REGIONAL INTEGRATION MAKE ASIAN ECONOMIES MOVE MORE IN SYNC?

Figure 3.2

#### Trade Intensity with the World<sup>1</sup> (In percent of GDP)



#### Intraregional Trade Intensity<sup>2</sup> (In percent of GDP)



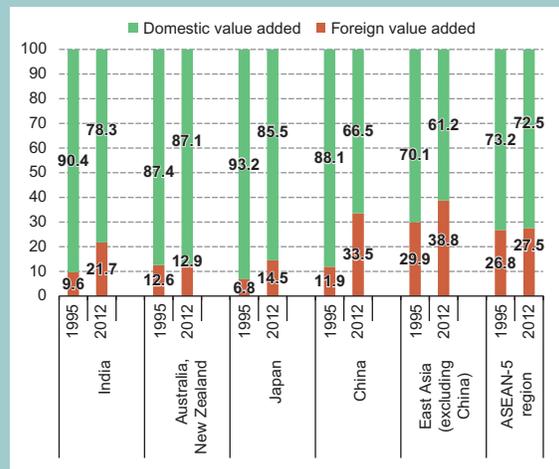
Sources: Organization for Economic Cooperation and Development and World Trade Organization, Trade in Value-Added database; and IMF staff estimates.

<sup>1</sup> For each region, based on the sum of trade intensity of economies in that region with the world. China supply chain includes China, Korea, Malaysia, the Philippines, Taiwan Province of China, and Thailand.

<sup>2</sup> For each region, based on the sum of trade intensity of economies in that region with each other. China supply chain includes China, Korea, Malaysia, the Philippines, Taiwan Province of China, and Thailand.

Figure 3.3

#### Domestic and Foreign Value-Added Embedded in Exports<sup>1</sup> (In percent of total gross exports)



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

<sup>1</sup> Values for 2012 are estimates.

#### *Intra-industry trade and similarity in trade specializations.*

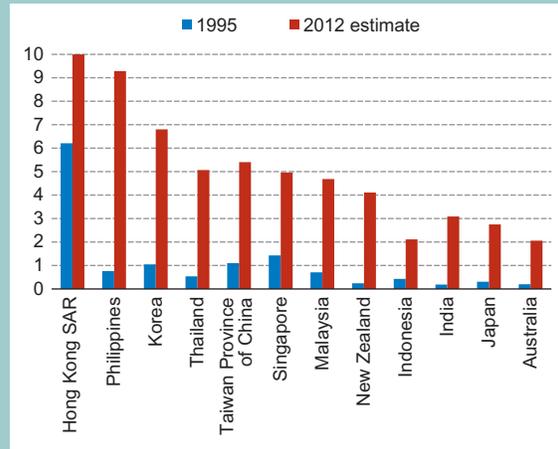
The degree of intra-industry trade has barely increased across Asia but, on average, it is slightly higher than in the rest of the world (Figure 3.7).<sup>5</sup> However, for ASEAN-5 the effect of having a similar industrial structure could be a more important factor in driving synchronization. Indeed, ASEAN-5 faces higher intra-industry trade and higher correlation between trade specializations—although the latter has declined since the 1990s, possibly reflecting increased specialization along the regional supply chain (Figure 3.8). This would mean that if most shocks are industry-specific, cycles should co-move more in ASEAN-5 than elsewhere.

<sup>5</sup> Note that conceptually, intra-industry trade differs from vertical trade since the former should reflect two-way trade in similar (finished or intermediate) goods, while the latter typically involves trade in different goods since many parts and components along the supply chain belong to different industries.

Figure 3.4

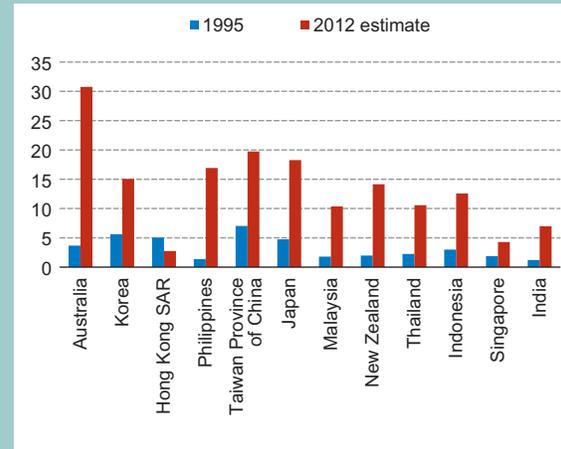
**Foreign Value-Added Embedded in Each Economy's Exports from: China**

(In percent of total exports of each economy)



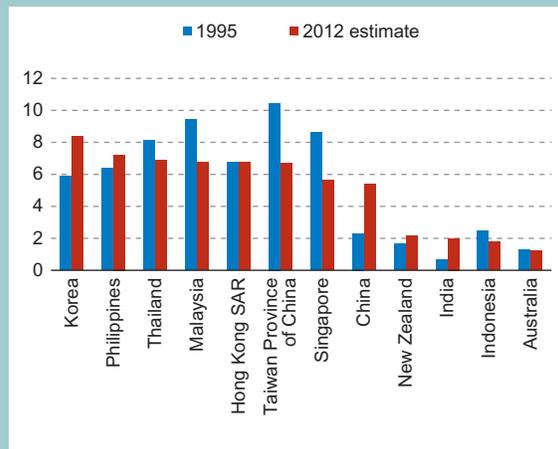
**Domestic Value-Added Embedded in Each Economy's Exports to: China**

(In percent of total exports of each economy)



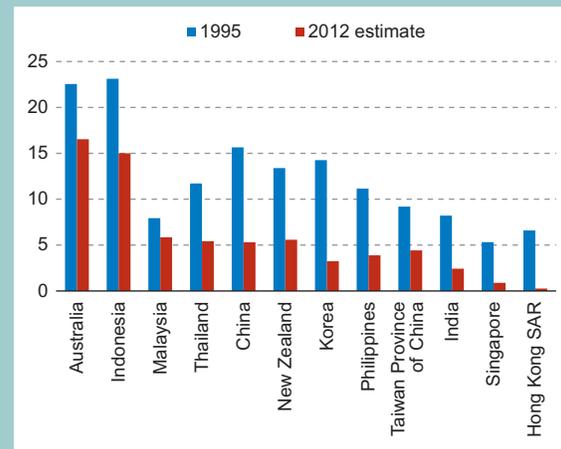
**Japan**

(In percent of total exports of each economy)



**Japan**

(In percent of total exports of each economy)



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

To take the analysis of these stylized facts further, the impact on BCS of each of these trade dimensions is assessed by means of econometric analysis. The growth correlation between each possible pair of economies within a broad sample of 63 Asian and non-Asian economies is expressed as a function of trade and other observed explanatory variables (such as financial integration) and unobserved variables (such as geographical

proximity). The methodology and key results are provided in Box 3.1.

The results from the empirical analysis confirm the following:

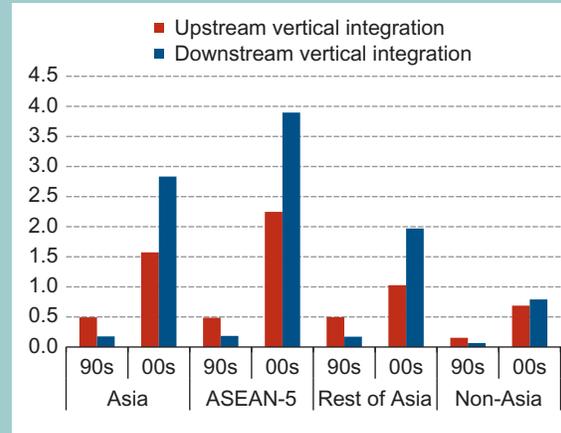
- Bilateral trade intensity—in valued-added rather than in gross terms—is an important factor in explaining the synchronization of cycles. Based on its estimated impact, it has accounted for

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Figure 3.5

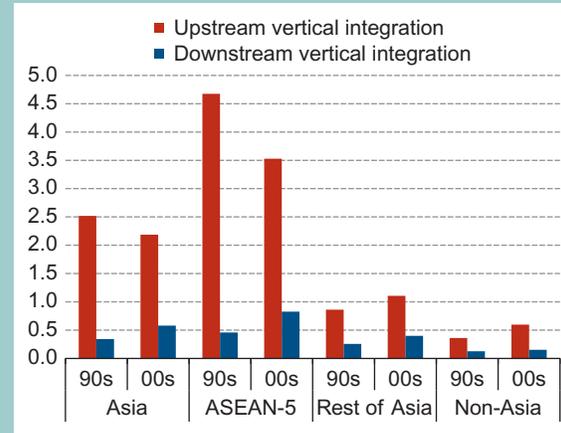
**Median Vertical Trade with China<sup>1</sup>**

(In percent of GDP)



**Median Vertical Trade with Japan<sup>2</sup>**

(In percent of GDP)



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

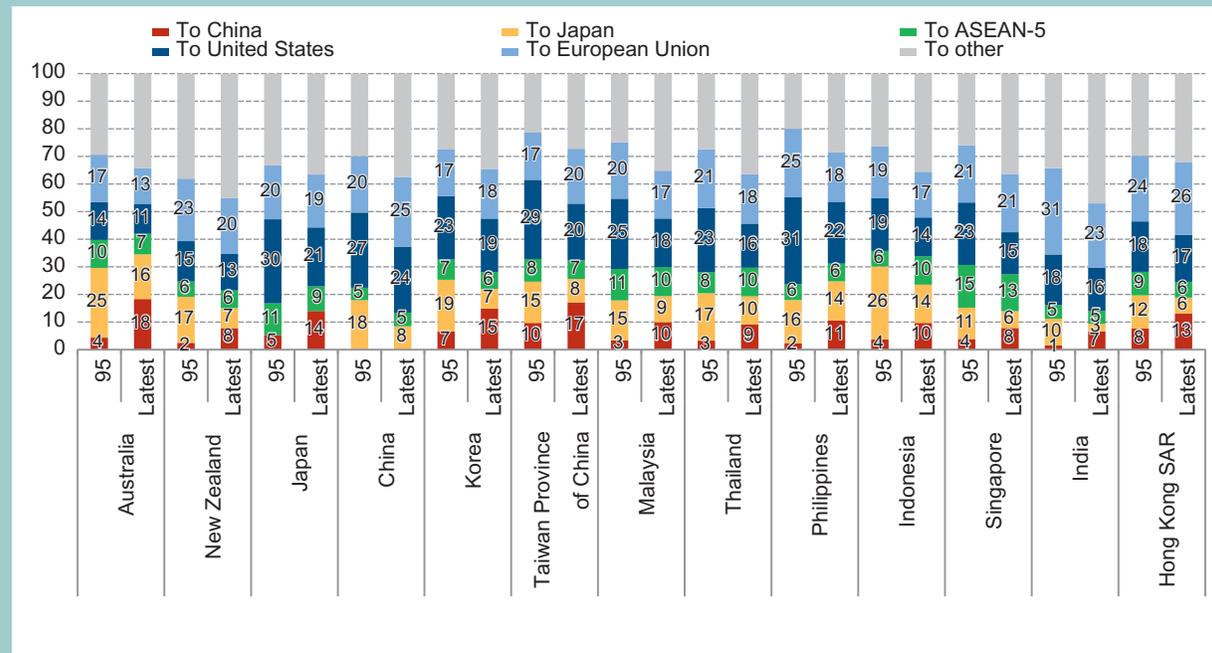
<sup>1</sup> Calculated as period medians of the median country pair. Upstream vertical integration of China with country j is defined as value added from China embedded in country j's exports; and downstream vertical integration of China with country j is defined as value added from country j embedded in China's exports.

<sup>2</sup> Calculated as period medians of the median country pair. Upstream vertical integration of Japan with country j is defined as value added from Japan embedded in country j's exports; and downstream vertical integration of Japan with country j is defined as value added from country j embedded in Japan's exports.

Figure 3.6

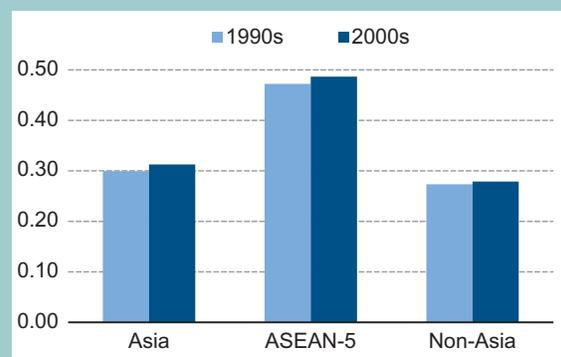
**Value-Added Exported to Partner Countries for Final Demand**

(In percent of total value added exported for final demand by the country)



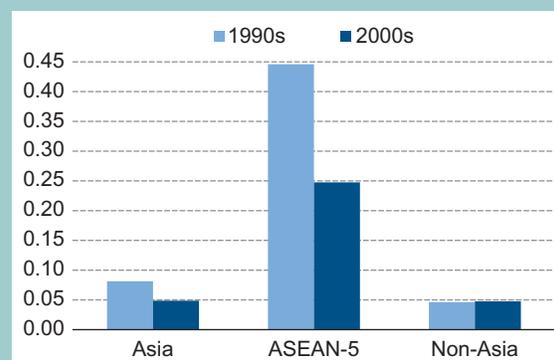
Sources: Organization for Economic Cooperation and Development and World Trade Organization, Trade in Value-Added database; and IMF staff estimates.

Figure 3.7

**Degree of Intra-Industry Trade***(Median intra-industry trade intensity—Grubel-Lloyd Index; ranges from 0 to 1)*

Sources: United Nations, COMTRADE database; and IMF staff estimates.

Figure 3.8

**Correlation of Trade Specializations***(Median bilateral correlations of trade specialization)*

Sources: United Nations, UNCTADstat database; and IMF staff estimates.

over a fourth of the trend rise in BCS in Asia, excluding crisis periods. The effect is bigger in crisis times, suggesting that trade integration offers an important channel for propagating shocks across borders. Trade is also one among several channels through which Pacific Island countries (PICs) have become gradually more connected to regional economies (Box 3.2).

- A higher degree of intra-industry trade and greater similarity in trade specializations has also led to greater co-movement. This suggests that industry-specific shocks are important and that having a similar economic structure means that economic cycles are likely to be correlated. However, while they are significant, these variables are quantitatively of little importance in explaining the trend rise in BCS in Asia because they have themselves changed little over time.
- The degree of vertical integration does not seem to have a distinct effect on synchronization over and above its impact through trade intensity. When vertical integration is measured as the extent to which one country's exports incorporate (foreign) value-added imported from another country (that is, intermediate inputs), it does not

distinctly affect synchronization. This could be because this additional effect is only relevant for specific supply shocks (such as natural disasters) and country pairs (such as the 2011 tsunami in Japan or the 2013 floods in Thailand) or because in many cases inputs are substitutable allowing supply chain disruptions to be mitigated.<sup>6</sup>

## The Role of Financial Integration

The empirical analysis also finds that greater banking and portfolio integration between two economies reduces their output co-movement most of the time (see Box 3.1). This is consistent with standard international business cycle theory, which predicts that the more financially integrated a pair of economies is, the more capital is likely to move from one economy to the other if a shock (such as a productivity shock) raises the return on capital in the latter economy, causing cycles to further diverge. In Asia, intraregional banking integration

<sup>6</sup> Using sector-level data for a sample of Asian and non-Asian economies, di Giovanni and Levchenko (2010) find greater output co-movement among industries that are more vertically integrated.

## Box 3.1

Assessing the Drivers of Business Cycle Synchronization and Spillovers<sup>1</sup>

Dynamic panels are used to assess the drivers of business cycle synchronization (BCS). The regressions aim to explain BCS between a pair of economies based on a set of explanatory variables including trade integration, trade characteristics, financial integration, and macroeconomic policy synchronization, depending on the specifications. All unobserved, time-invariant, country-pair idiosyncratic influences on BCS, such as geographical proximity or the existence of a common language, are also controlled for through country-pair fixed effects. Finally, global common shocks affecting countries across the board, which can make them co-move simultaneously, are accounted for by means of time fixed effects. Specifically, the estimated specification is written as:

$$QCORR_{ijt} = \alpha_{ij} + \alpha_t + f(\text{TRADE}_{ijt-1}, \text{FINANCE}_{ijt-1}, \text{POLICY}_{ijt-1}) + \varepsilon_{ijt},$$

where  $QCORR_{ijt}$  is the instantaneous quasi-correlation between the growth rates of countries  $i$  and  $j$  at time  $t$ ;  $\alpha_{ij}$  is a country-pair fixed effect,  $\alpha_t$  is a time dummy, TRADE captures the four trade variables mentioned in the text, FINANCE includes financial integration variables, and POLICY includes policy synchronization variables. The trade, finance and policy variables enter the regressions lagged one period to mitigate endogeneity concerns (since higher BCS would likely induce more trade and more co-movement), and in various combinations depending on the specifications.

Key results—which are robust to estimation over a shorter period that excludes the global financial crisis—are presented in Table 3.1.1. While gross trade does not seem to matter for BCS (column 1), trade in value-added is a significant driver (column 2). This confirms the importance of focusing on value-added trade when assessing growth spillovers between countries. The intensity of intra-industry trade between economies and the correlation of their trade specializations also increase BCS (column 3), and the results are robust to instrumenting trade integration to address its potential endogeneity with respect to BCS (column 4).<sup>2</sup> Banking integration appears to reduce BCS on average (column 5), and so does portfolio integration (column 6). However, these findings are not very robust, and in fact financial integration appears to significantly *increase* BCS in crisis times (column 8), as shown by the positive interaction between this variable and a time dummy for the global financial crisis (for a similar result, see also IMF, 2013d). Likewise, the impact of trade integration is bigger in crisis times (column 8). Finally, more synchronized fiscal policies increase bilateral co-movement and, along similar lines, more divergent monetary policies and more volatile bilateral exchange rates reduce it (column 7).

Finally, in a complementary but separate exercise, the propagation of growth shocks originating from China to its trading partners through the trade channel is assessed by estimating the following equation on quarterly data:

$$g_{it} = \alpha_i + \beta t + \varphi_1(l) \text{shock}_{China,t} + \varphi_2(l) \text{shock}_{China,t} \text{TradeLink}_{iChina,t-1} + \varphi_2(l) \text{TradeLink}_{iChina,t-1} + X'_{it} \beta + \varepsilon_{ij},$$

where  $g_{it}$  is the quarterly GDP growth rate of country  $i$  at time  $t$ ,  $\text{shock}_{China,t}$  is a shock to China's growth (identified simply here as the residual growth rate that remains after removing China's average growth rate over the sample period and the average growth rate of all countries during a given quarter, following Morgan, Rime and Strahan, 2004), and  $X_{it}$  includes other controls, including controls for global growth drivers like the world oil price and global financial uncertainty (measured by the VIX).  $\text{TradeLink}_{iChina,t-1}$  captures bilateral trade linkages with China (for which a quarterly series is obtained by interpolating available end-year observations for bilateral *value-added* using quarterly fluctuations of bilateral *gross* trade); the most significant variable turns out to be the value-added “exported” to China for final demand purposes (as a share of the exporting country's GDP). The positive coefficients  $\varphi_2$  imply that dependence on China as a source of external final demand is a propagation mechanism for growth shocks originating from China.

<sup>1</sup> The main authors are Romain Duval and Dulani Seneviratne.

<sup>2</sup> The instruments used include time-varying gravity variables, comprising: (1) the product of the real GDP of the two countries; (2) a World Trade Organization membership dummy; (3) the degree of trade cooperation between countries; (4) a geographical distance index; and (5) the average import tariff of the two countries.

## Box 3.1 (continued)

Table 3.1.1 Business Cycle Synchronization and Trade Integration<sup>1</sup>

Dependent Variable: Quasi-correlation of output growth rates	OLS	OLS	OLS	IV	IV	IV	IV	IV
	A: Trade Integration				B: Financial Integration & Policy Synchronization			C: Crisis vs. Non-crisis
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trade Intensity (Gross)	0.0399 (0.0262)							
Trade Intensity		0.0488*** (0.0154)	0.0632*** (0.0152)	0.295*** (0.0709)	0.575*** (0.0898)	0.851*** (0.280)	0.466*** (0.180)	0.430*** (0.0987)
Intra-industry Trade			0.00313*** (0.00116)	0.00326*** (0.00119)				
Trade Specialization Correlation			1.261*** (0.157)	1.419*** (0.166)				
Banking Integration					-0.0343*** (0.0127)	-0.0488*** (0.0140)	-0.0543*** (0.0125)	-0.00410 (0.0124)
Portfolio Integration						-4.897* (2.620)		
FDI Integration						-1.338 (0.952)		
Fiscal Policy Coordination							0.0587*** (0.0127)	
Monetary Policy Divergence							-0.00339** (0.00149)	
Exchange Rate Volatility							-0.136*** (0.0168)	
Trade Intensity * GFC dummy								0.753*** (0.170)
Banking Integration * GFC dummy								0.383*** (0.0633)
R-squared	0.58	0.58	0.58	0.58	0.65	0.77	0.66	0.68
Observations	18224	18619	18619	18614	12159	2860	9095	12115

Source: IMF staff estimates.

<sup>1</sup> Standard errors, clustered at country-pair level, are given in parentheses. GFC = global financial crisis. \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.

## Box 3.2

Pacific Island Countries: Regional Integration and Growth Spillovers<sup>1</sup>

Integration of the Pacific Island countries (PICs) with Australia, New Zealand, and emerging Asia has strengthened over the last two decades, increasing the PICs' exposure to regional business cycles. Indeed, spillovers from regional economies are more important for PICs than those from advanced economies outside the Asia-Pacific region, and co-movement of output between the PICs and regional economies have strengthened (Figure 3.2.1). This regional integration has greatly benefited the PICs, but poses new challenges.

The main channels of spillovers are different across the PICs given their heterogeneity. They include, to varying degrees, tourism, remittances, FDI, aid, and financial linkages. Traditional trade partners (Australia and New Zealand) account for 30 percent of PICs' total trade, while trade with emerging Asia has accelerated in recent years to about the same share. Tourism has gradually become important for several PICs; it now accounts for between one-fifth and one-half of GDP in Fiji, Palau, Samoa, and Vanuatu. Remittances are also an important channel of spillover in Kiribati, Samoa, Tonga, and Tuvalu. Australia is by far the largest foreign investor in the region, but investments from emerging Asia have also increased in recent years. And aid flows average 20 percent of PICs' GDP, with Australia among the largest aid providers. PICs' financial sector is dominated by foreign banks, particularly Australian banks. Several PICs—including Kiribati, Tuvalu, and the Compact countries (Marshall Islands, Micronesia, and Palau)—have large trust funds with assets invested offshore, including in

<sup>1</sup> The main author is Yiqun Wu.

(continued)

**Box 3.2** (continued)

regional financial markets. Although remittances and aid have provided some countercyclical support in the past, they have been also subject to the cyclical position of the originating countries.

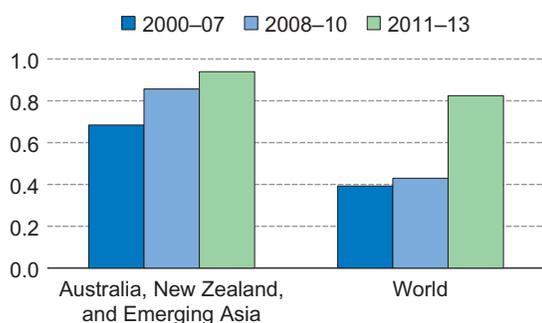
Integration between the PICs and emerging Asia—especially China—has grown rapidly, although from a low base (Figure 3.2.2). PICs' exports to emerging Asia have increased sevenfold since the early 1990s, while their imports from emerging Asia have expanded more than fourteen times—with China becoming, for example, Solomon Islands' largest trading partner. Tourist arrivals and FDI from China have also surged recently in several PICs, including Fiji and Vanuatu. And China's role will further strengthen with the recent commitment to disburse US\$2 billion to the Pacific islands in concessional loans (one of them devoted to infrastructure).

Staff estimates suggest important growth spillovers from regional economies to PICs.<sup>2</sup> Australia is by far the main source of direct and indirect spillovers, except for the Compact countries, for which the United States has the largest impact, likely reflecting U.S. aid. Spillovers from New Zealand, directly or through Australia, are also large for several PICs. The impact of shocks from emerging Asia on PICs' growth has increased over the last decade. In the short run, the elasticity of output with respect to regional partners is generally greater than one.

Continued integration of PICs with regional economies would help boost potential growth in PICs. Tapping emerging Asia's growth, including—but not limited to—tourism and agriculture will be key and could be greatly facilitated by enhanced regional cooperation and increased connectivity.<sup>3</sup>

With increased integration, effects of external shocks on PICs will be further amplified and these economies will need more policy space. PICs need to strengthen their resilience to adverse shocks by quickly rebuilding policy buffers to avoid procyclical monetary and fiscal responses.<sup>4</sup> While rebuilding policy buffers, additional assistance from development partners will continue to be critical for supporting long-run growth prospects. Implementing structural reforms and creating a more investor-friendly business environment would also help attract FDI. In addition, public investment in infrastructure, health, and education will attract private investment, including in the tourism sector.

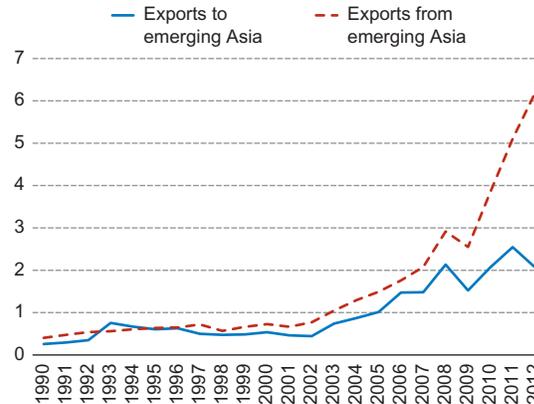
Figure 3.2.1  
**Pacific Island Countries: Integration with World and Regional Economies<sup>1</sup>**  
(GDP growth rate correlations)



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

<sup>1</sup>Figures report correlation of growth between regional economies and Pacific Island countries (PICs), and between the world and PICs, respectively.

Figure 3.2.2  
**Pacific Island Countries: Trade with Emerging Asia**  
(In billions of U.S. dollars)



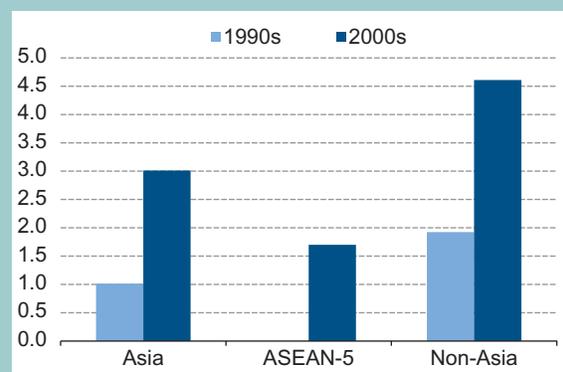
Sources: IMF, Direction of Trade Statistics database; and IMF staff calculations.

<sup>2</sup> Sheridan, Tumbarello, and Wu (2012) developed a vector error correction analysis for each PIC to gauge the impact of global and regional spillovers.

<sup>3</sup> Recent gravity regression results underscore the importance of establishing tourism links with large and fast-growing source countries (Chen and others, forthcoming).

<sup>4</sup> See Tumbarello and others (2013) for an analysis of fiscal procyclicality in the Pacific Islands.

Figure 3.9

**Median Bilateral Banking Integration<sup>1</sup>***(In percent of total external position with the world)*

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

<sup>1</sup> Calculated as period medians of the median country pairs in each group (for a definition of the variable, see Appendix II in Duval and others, 2014). Data for the 1990s are unavailable for ASEAN-5 as a whole.

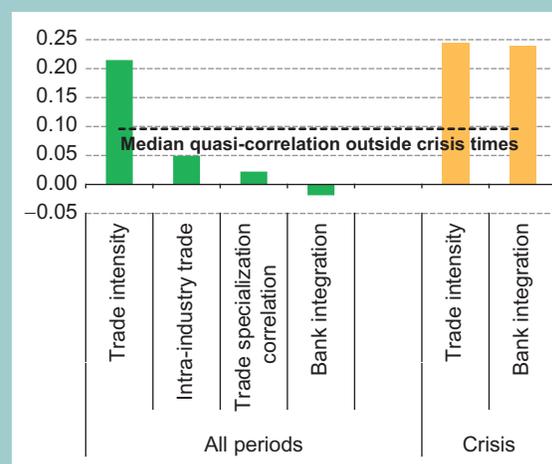
is relatively low (Figure 3.9), so banking integration is likely to have had only a limited effect on the co-movement of cycles in normal times.

However, during periods of crisis, banking integration does appear to increase the synchronization of cycles across countries. In such cases, global banks pull funds away from all countries, amplifying output co-movement for those that are more financially integrated and reliant on foreign capital flows (Kalemli-Ozcan, Papaioannou, and Perri, 2013). As Figure 3.10 shows, the estimated impact on BCS of greater banking integration was large during the global financial crisis, and similar to the effect of greater trade integration. Nevertheless, for Asia, this effect is still somewhat smaller than was witnessed in other regions.

## The Role of Synchronized Macroeconomic Policies

Apart from trade and financial integration, macroeconomic policy matters for BCS, including in Asia. Specifically, if two countries synchronize their policies—whether on purpose or not—by implementing expansionary or contractionary

Figure 3.10

**Illustrative Impact of Explanatory Variables on Co-movement: Crisis Versus Non-crisis Times<sup>1,2</sup>**

Source: IMF staff estimates.

<sup>1</sup> Based on the estimated impact on business cycle synchronization of moving from the 25th percentile to the 75th percentile of the cross-country distribution of the variable considered.

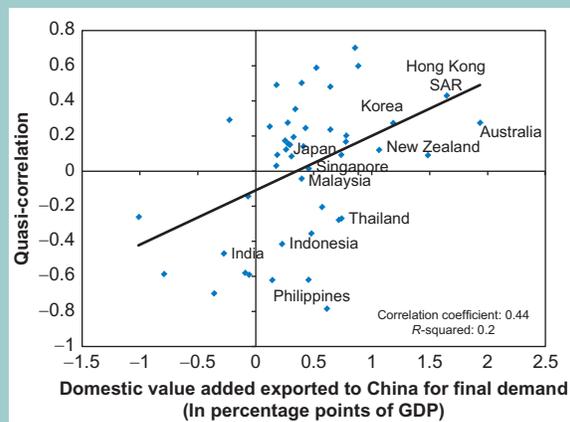
<sup>2</sup> Given model uncertainty, the coefficients used to compute the contribution of each explanatory variable are the median values across the models in columns (1) and (3) in Tables 3 and 4 of Duval and others (2014).

policies at the same time, bilateral output co-movement would be expected to rise, all else equal. Accordingly, the empirical analysis assesses the impact on BCS of simple indicators of synchronization of monetary and fiscal policy *shocks*—that is, abstracting from the systematic response of macroeconomic policies to cyclical developments—as well as the effect of exchange rate policies. The analysis finds that all three raise BCS. *On average*, Asia does not stand out relative to non-Asia as regards the synchronization of macroeconomic policies: in Asia, fiscal policy synchronization is low, even though it rose in 2009 with the widespread stimulus implemented in the aftermath of the global financial crisis; monetary policies are not more synchronized and bilateral exchange rates are no less volatile than elsewhere.

## The Role of Spillovers from China

A further source of output co-movement in Asia is the growing importance for other economies of China's domestic demand. In its (declining) role as

Figure 3.11  
**Change in Output Co-movement with China and Value-Added Exported to China for Final Demand**  
 (Change from early 2000s to latest)

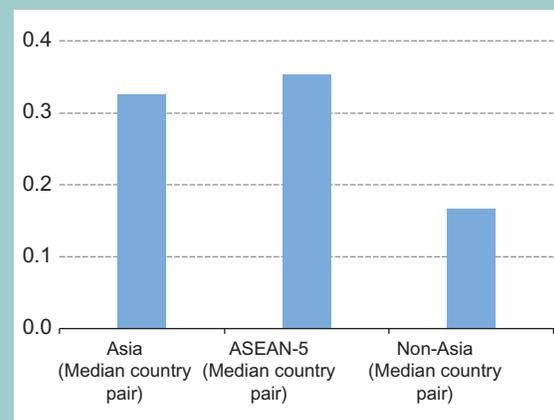


Sources: IMF, World Economic Outlook database; Organization for Economic Cooperation and Development and World Trade Organization, Trade in Value-Added database; and IMF staff estimates.

the “assembly hub” of Asia, China’s economy does not *directly* affect its trade partners much since it primarily propagates shocks coming from advanced economies primarily through the regional supply chain. But China is now a growing source of final demand as well, and with a large share of that final demand being met by production in other parts of Asia, China has a bigger direct impact than in the past. And indeed, economies whose trade dependence on China’s final demand have increased over the past decade have generally experienced a greater increase in their cyclical co-movement with China during the period (Figure 3.11).

Further empirical analysis (see Box 3.1 for details) finds that economies that depend more on China for their export of final goods and services are more affected by growth shocks originating from China (Korea, Malaysia, Thailand, Taiwan Province of China, as opposed to India or Japan whose value-added exported to China makes only a small share of their total GDP). Based on these results, Figure 3.12 suggests that a one percentage point decline in China’s growth may lower GDP growth in the median Asian economy by about 0.3 percentage point after a year, compared with 0.15

Figure 3.12  
**Estimated Impact of 1 Percent Growth Surprise in China on Partner Country Growth<sup>1</sup>**  
 (Median GDP growth impact after one year, in percentage points)



Source: IMF staff estimates.

<sup>1</sup> Estimates based on column (3) of Table 5 in Duval and others (2014).

in the median non-Asian economy. These numbers are fairly close to those obtained in one of the two approaches followed by Ahuja and Nabar (2012) and in IMF (2012a), but they are larger than the other set of estimates.

## Implications for the Future

The analysis in this chapter implies that BCS among Asian economies should continue to rise insofar as economic integration increases further.

On the trade front, further integration hinges on trade liberalization in sensitive areas, including services. This will require significant policy commitment, including from ASEAN policymakers as part of the ASEAN economic community. Living standards would get a boost, but so would spillovers within the region. Increasing the share of value-added from trade would drive greater economic co-movement in the coming years, and it could be a propagation mechanism that transmits shocks during crises. A mitigating factor is the potential increase in trade specialization (that is, the decline in similarity of export structure) across the

region that further trade liberalization might also foster.<sup>7</sup>

Growth shocks emanating from China are also likely to increasingly affect shock propagation and synchronization in the region as the (already strong) role of China as a source of final demand grows in importance. By contrast, China's role as a conduit for external shocks may diminish insofar as its role as the region's "assembly hub" continues to decline.

Greater financial integration is likely to have a more ambiguous effect going forward. In crisis times, financial linkages will likely strengthen spillovers and the synchronization of cycles. However, in normal times, the likely effect of greater cross-border financial flows is more ambiguous, according to both theory and empirical evidence.

The main challenge for policymakers will be to minimize these side effects so as to reap the economic benefits that greater integration can have for productivity, regional savings allocation, resilience to shocks from outside the region, and, ultimately, living standards. Domestic policies can help, for example, by maintaining the macroeconomic policy space needed to respond to shocks, and the degree of exchange rate, wage, and price flexibility needed to adjust to them. As trade and financial integration rise, so will BCS. Provided

adequate monetary and fiscal space is built and maintained to allow counter-cyclical policies to be run, macroeconomic policies are likely to become more aligned as a result.

A case can also be made for increasing international policy cooperation, for instance on financial oversight and crisis management. In particular, stronger co-movement among the most integrated economies means they would tend to face synchronized downturns and—depending on the nature of the shocks they would face—simultaneous external financing pressures. Self-insurance through further reserve accumulation can help individual countries buffer such shocks, but this approach is costly and does not provide risk sharing between countries. This points to a potential stabilizing role for broader financial safety nets. In the case of ASEAN economies, these include the Chiang Mai Initiative Multilateralisation, of which China, Japan, and Korea are also members, as well as bilateral swap lines between regional central banks. These regional initiatives can usefully complement bilateral swap lines with nonregional central banks and the global financial safety net provided by the IMF, which will be most useful in the event of shocks affecting or spilling over to the region as a whole.

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<sup>7</sup> Greater trade specialization could reduce output *synchronization* as industry-specific shocks would have more heterogeneous effects across different economies, but it might still increase output *volatility* by making economies less diversified.