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**Spillovers from China's Growth Slowdown and  
Rebalancing to the ASEAN-5 Economies**

by Allan Dizioli, Jaime Guajardo, Vladimir Klyuev, Rui Mano, and Mehdi Raissi

**I N T E R N A T I O N A L M O N E T A R Y F U N D**

**IMF Working Paper**

Asia Pacific Department

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**Abstract**

After many years of rapid expansion, China's growth is slowing to more sustainable levels and is rebalancing, with consumption becoming the main growth driver. This transition is likely to have negative effects on its trading partners in the near term. This paper studies the potential spillovers to the ASEAN-5 economies through trade, commodity prices, and financial markets. It finds that countries with closer trade linkages with China (Malaysia, Singapore, and Thailand) and net commodity exporters (Indonesia and Malaysia) would suffer the largest impact, with growth falling between 0.2 and 0.5 percentage points in response to a decline in China's growth by 1 percentage point depending on the model used and the nature of the shock. The impact could be larger if China's slowdown and rebalancing coincides with bouts of global financial volatility. There are also opportunities from China's rebalancing, both in merchandise and services trade, and there is preliminary evidence that some ASEAN-5 economies are already benefiting from these trends.

JEL Classification Numbers: C32, F44, F62, O41, O53.

Keywords: China's slowdown and rebalancing, international business cycle, spillovers, Global VAR, Flexible System of Global Models (FSGM), ASEAN-5.

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## I. INTRODUCTION

China's sustained strong economic growth over the last several decades not only propelled it to the position of the largest economy in world in purchasing power parity; it also stimulated growth in its trading partners. Now China is undergoing a structural transformation that is likely to have a profound impact on the rest of the world. Its growth is slowing to more sustainable levels and the economy is rebalancing, with consumption becoming the main growth driver and investment slowing. China's slowdown and rebalancing are likely to generate spillovers to other countries through various direct and indirect channels.

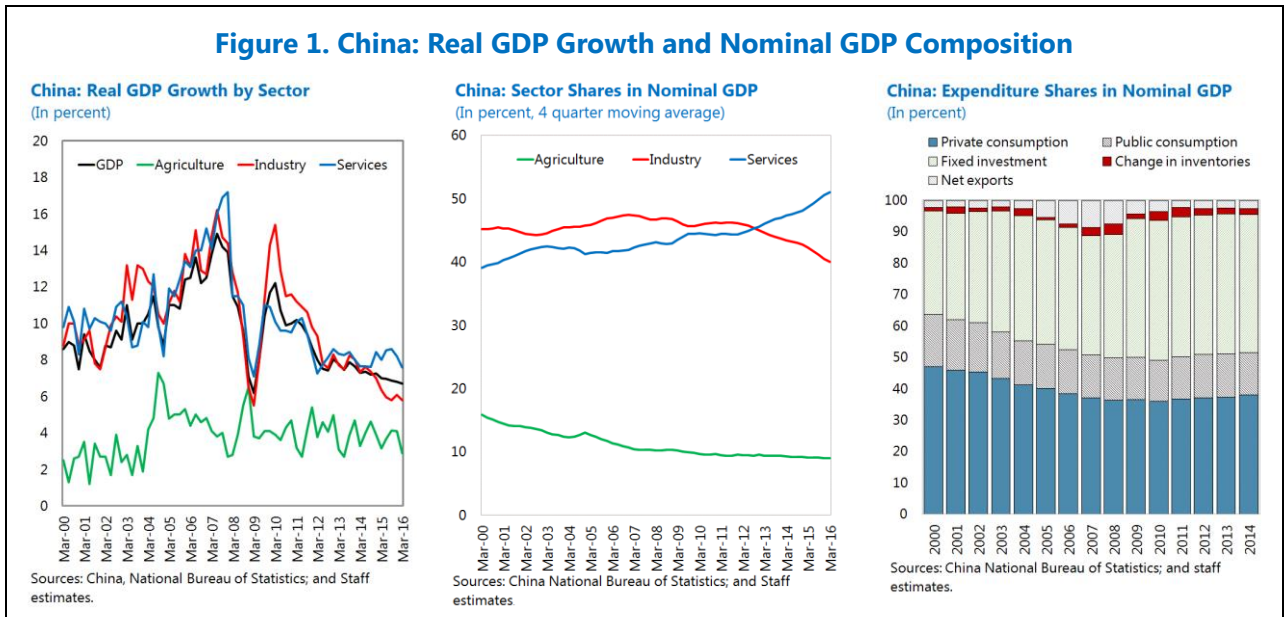
The ASEAN-5 economies—Indonesia, Malaysia, the Philippines, Thailand, and Singapore—are in close geographic proximity to China. They are, on average, quite open to trade and involved in production chains, for which China is the processing hub or final destination. These countries have fairly open capital markets and export large amounts of commodities, either raw or processed (such as refined petroleum in Singapore and petrochemicals in Thailand). Thus, China's slowdown and rebalancing may have a large impact on them.

The issue of spillovers from China has received extensive attention in recent years, including coverage in the IMF's Spillover Reports (IMF 2011, 2012, 2014a) and Regional Economic Outlooks for Asia and the Pacific (IMF 2014b, 2015, 2016a). Asian economies appear as particularly exposed. Duval and others (2014) find that growth spillovers from China are sizable, and larger in economies that are more dependent on China's final demand in value-added terms. The average impact of a 1 percent fall in China's GDP is 0.3 percent for a median Asian economy and 0.15 percent for a median non-Asian economy. The driver of China's slowdown also matters for the impact. Ahuja and Malhar (2012) find that a 1 percent decline in China's fixed investment reduces Indonesia's GDP by 0.1 percent, Malaysia's by 0.6 percent, the Philippines' by 0.2 percent, and Thailand's by 0.4 percent. The impact is proportional to their exports to China. On the other hand, changes in China's consumption do not have statistically significant effects. Hong and others (2016) find that a 1 percent fall in investment combined with a 1 percent rise in consumption in China lowers GDP by 0.1 percent in Malaysia and Singapore, 0.07 percent in the Philippines, and 0.05 percent in Indonesia and Thailand. Thus, rebalancing from investment to consumption in China, even with unchanged total domestic demand, would lower growth in the ASEAN-5 economies. In other work, China's economic activity has been found to have an important effect on oil prices (IMF 2011; Anderson and others, 2015).

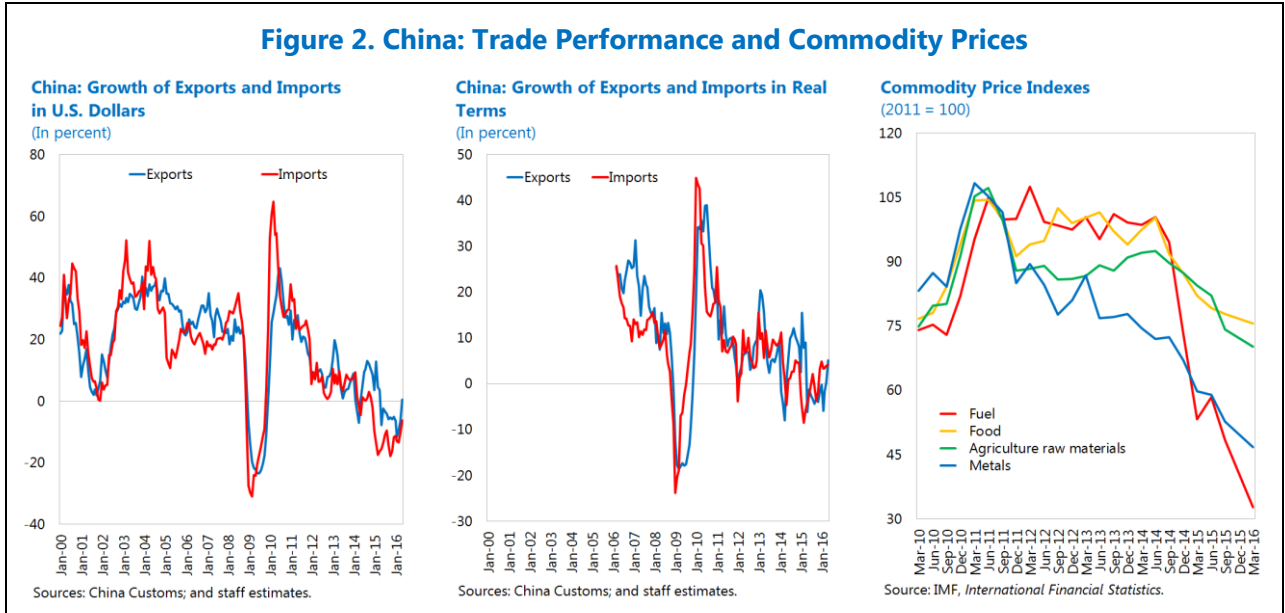
This paper assesses the impact of China's transition on the ASEAN-5 economies. It considers three main channels of transmission—trade, commodity prices, and financial markets. For each channel, it documents the exposures of the ASEAN-5 to China. It then studies the likely impact of China's slowdown and rebalancing using a variety of analytical approaches. It also examines the recent performance of the ASEAN-5 exports and financial markets, exploring to what extent they may be linked to developments in China. It finally presents opportunities for ASEAN-5 from China's transition in both merchandise and services trade.

## II. CHINA'S TRANSITION

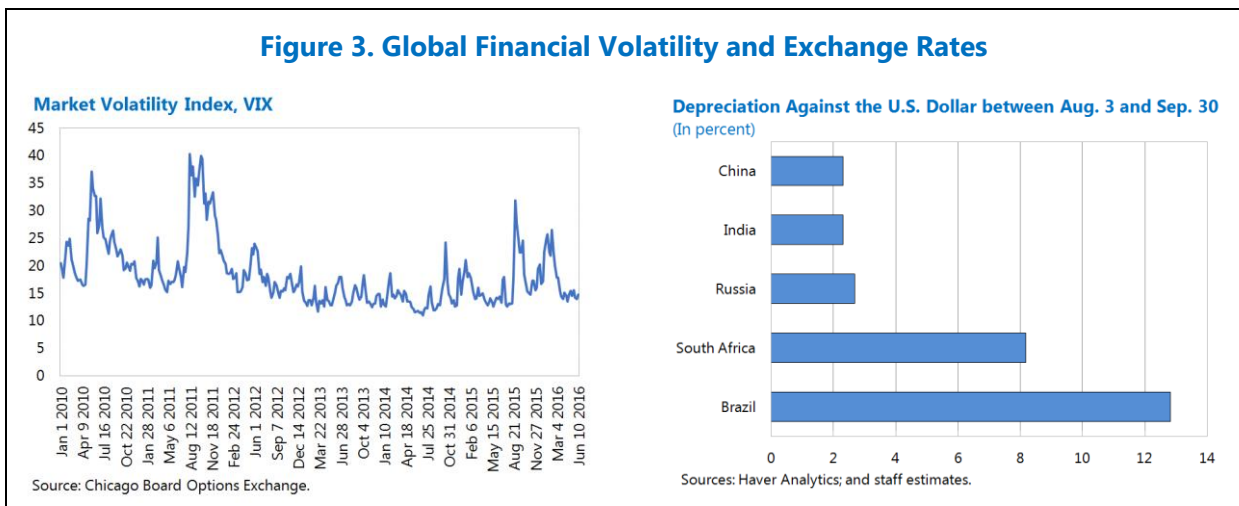
China experienced a long period of exceptionally high growth rates, with real GDP growth averaging 10 percent during 2000-11 (Figure 1). Growth has been moderating after to under 7 percent since 2015 as China transitions to a new model with slower but more sustainable growth. Not only has China's growth been slowing, but also its composition has been changing. The share of industry in GDP is falling, while that of services is increasing. There are also tentative signs of rebalancing from investment to consumption.



As the economy slowed, China's trade in U.S. dollars decelerated since 2011, with both exports and, even more so, imports declining substantially in 2015 (Figure 2). The fall in commodity prices was a major contributor to that development, but volume growth also slowed noticeably. The decline in nonfuel commodity prices has been attributed to a large extent to a slowdown in China's demand and a reassessment of future demand as China is a large player in that market, even though other developments, particularly on the supply side, have also played a role (IMF 2016a). The role of China in the oil market is smaller, with a large share of the recent fall in oil prices due to oversupply and weak demand elsewhere.



The transition in China has also resulted in bouts of global financial volatility as the market reassessed the underlying strength of the Chinese economy. In particular, the VIX spiked in August 2015, when China's stock market prices fell sharply despite official support, and the renminbi fixing mechanism was adjusted, leading to renminbi depreciation vis-à-vis the U.S. dollar (Figures 3). That was the first time that events in China triggered a major jump in the VIX. This shock led to currency depreciation in many emerging market economies. Another flare-up occurred in January 2016 coinciding with another large price decline in China's stock market.



Given its large, China's slowdown and rebalancing can have significant spillovers to trading partners and commodity exporters, including the ASEAN-5 economies. Moreover, the spikes in global financial volatility associated with developments in China could transmit financial shocks internationally and could also amplify the spillovers through other channels.

### III. ASEAN-5 EXPOSURES TO CHINA

We consider three channels through which China's slowdown and rebalancing can affect the ASEAN-5 countries: trade, commodity prices, and financial markets. Trade is likely the most important channel as China is a key trading partner for all these economies not only in goods, but also in services such as tourism. Spillovers from commodity prices are adverse for the net commodity exporters (Indonesia and Malaysia), but positive for the net commodity importers (the Philippines, Singapore, and Thailand). The financial channel is also important for all the ASEAN-5 countries, especially through spikes in global financial volatility. Direct financial spillovers are likely less important as direct financial links between China and the ASEAN-5 economies are limited.

#### A. Trade Channel

Exposures to China through the trade channel are significant but not overwhelming for the ASEAN-5 economies. Their exports to China ranged between 10 and 14 percent of their total merchandise exports in 2014 (Figure 4). Given the differences in trade openness among the ASEAN-5 economies, exports to China as a ratio to GDP vary substantially, from 2 percent for Indonesia to 17 percent for Singapore. It should be noted that for the ASEAN-5 countries China is not a dominant, and for some of them, not the most important trading partner. These countries export at least as much of their goods to other ASEAN-5 economies—and some of them send more than twice as much—as they do to China.

Examination of value-added trade provides a complementary perspective. Figure 5 shows an increasing share of GDP in the ASEAN-5 countries linked to China's domestic demand.<sup>1</sup> That share is highest in Malaysia (8 percent of GDP in 2011), indicating its considerable exposure to changes in China's domestic demand. Reflecting large re-exports and processing trade, Singapore's value added in China's domestic demand, at 6 percent of GDP, was only a bit over a third of its gross exports to China in 2011. Thailand, the Philippines, and Indonesia have smaller exposures at 5, 4, and 3 percent of GDP, respectively. Interestingly, for the last two countries value added embedded in China's domestic demand was slightly higher than their gross exports to China in 2011, indicating that some of their gross exports to other countries find their way to China's domestic demand.

Given the ongoing rebalancing from investment to consumption in China, the destination of exports matters. Except for Thailand, ASEAN-5 exports are more linked to investment than to consumption in China, and considerably so in the Philippines and Singapore, suggesting that rebalancing would adversely affect these countries on top of the growth slowdown. The impact may also be exacerbated if the import intensity of investment continues to decline as more investment goods are produced domestically in China.

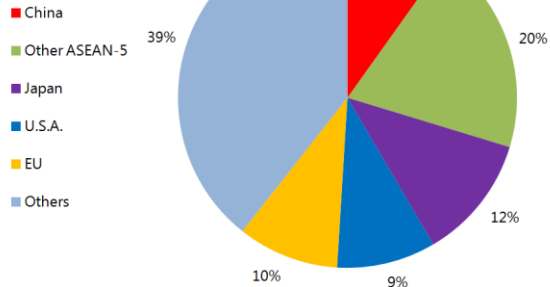
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<sup>1</sup> The latest data available in the OECD's TiVA database is 2011, which was a year of high commodity prices. This could overstate the exposures for commodity exporters such as Indonesia and Malaysia.



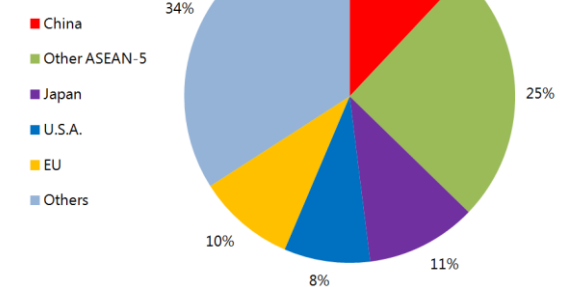
**Figure 4. ASEAN-5: Composition of Merchandise Exports by Trading Partner, 2014**

**Indonesia**  
(In percent)



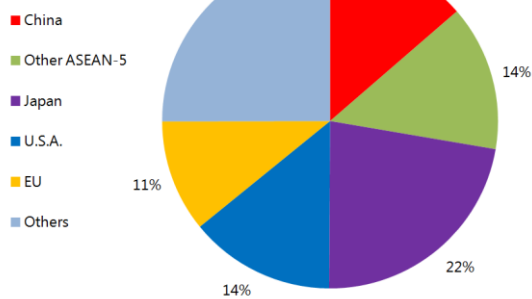
Sources: Bank Indonesia; and staff estimates.

**Malaysia**  
(In percent)



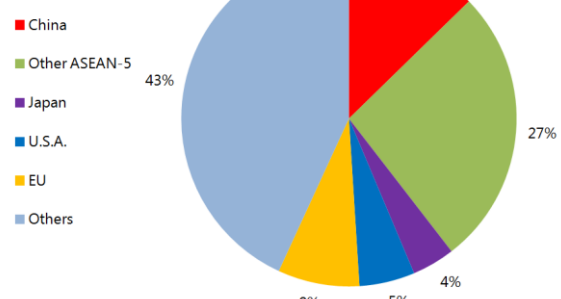
Sources: Malaysia, Department of Statistics; and staff estimates.

**Philippines**  
(In percent)



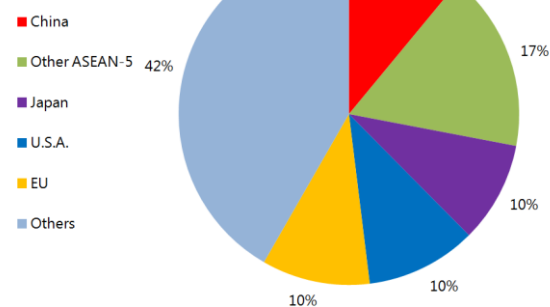
Sources: Philippines, National Statistics Office; and staff estimates.

**Singapore**  
(In percent)



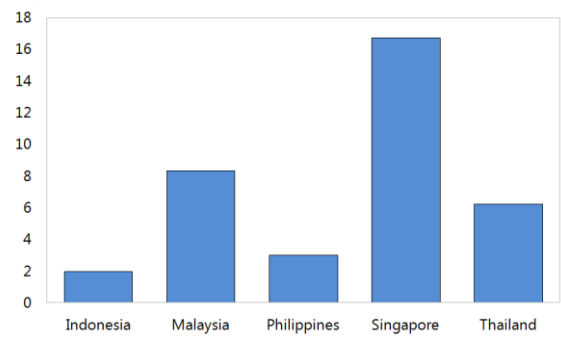
Sources: International Enterprise Singapore; and staff estimates.

**Thailand**  
(In percent)



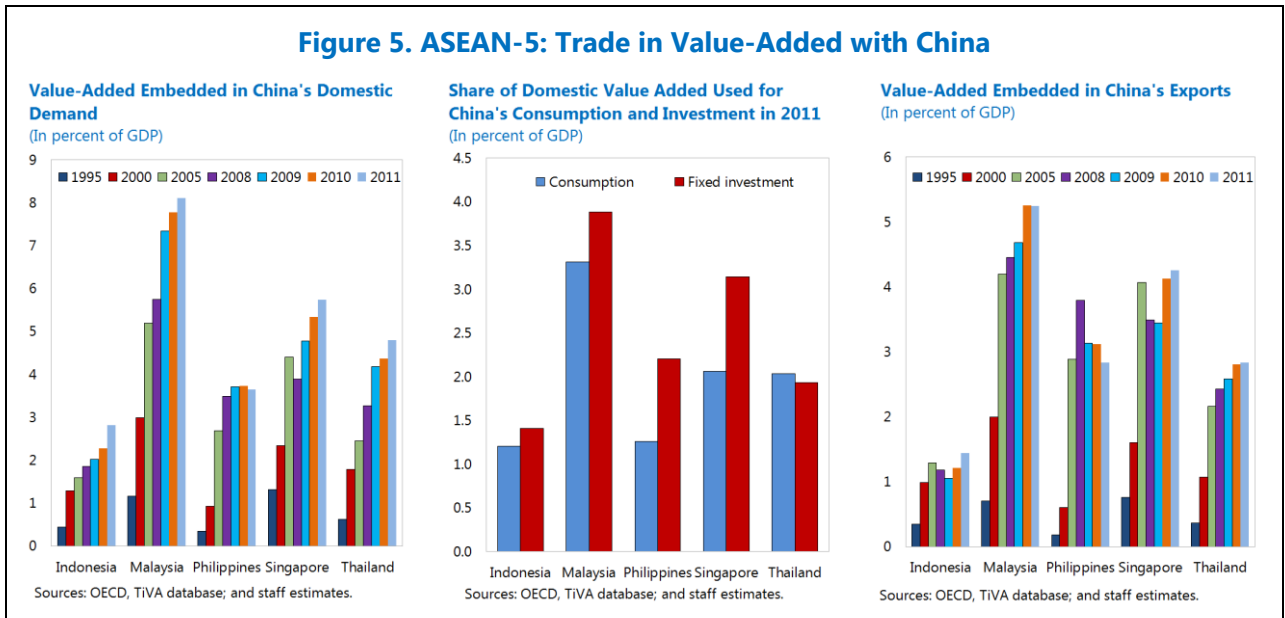
Sources: Thailand, Customs Department; and staff estimates.

**ASEAN-5: Exports to China**  
(In percent of GDP)

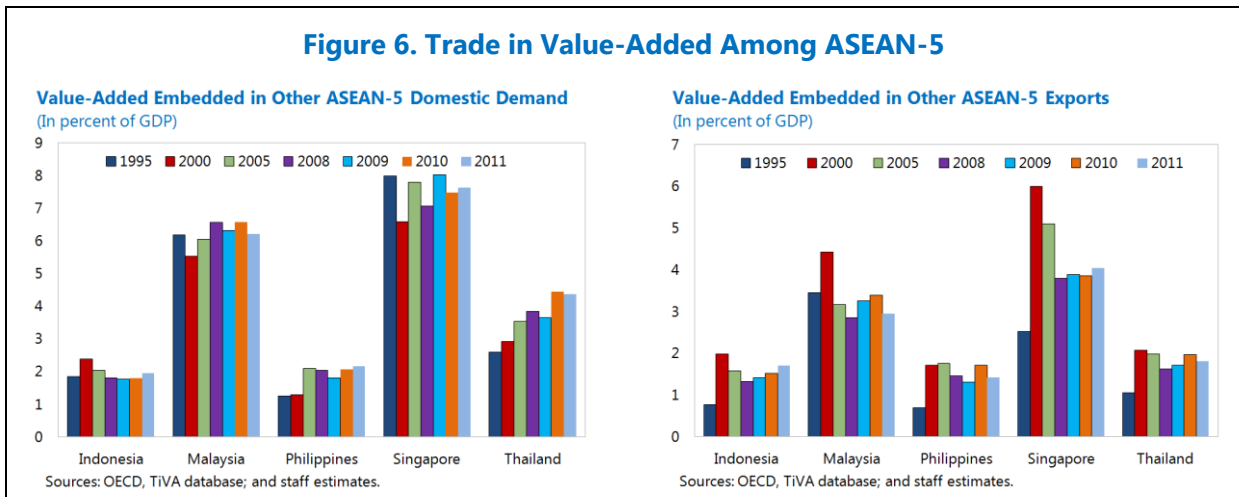


Sources: Country authorities; and staff estimates.

But it is not just China's final demand that matters. If global demand for China's exports falls as the world economy sputters or as production cost goes up in China, foreign suppliers of intermediate inputs into China's export production will be affected. In addition, that part of the ASEAN-5 economies' value-added is also vulnerable to China's on shoring as China would rely less on foreign intermediate goods for the production of final goods. Here again, Malaysia is the most vulnerable, while Indonesia is the least exposed.

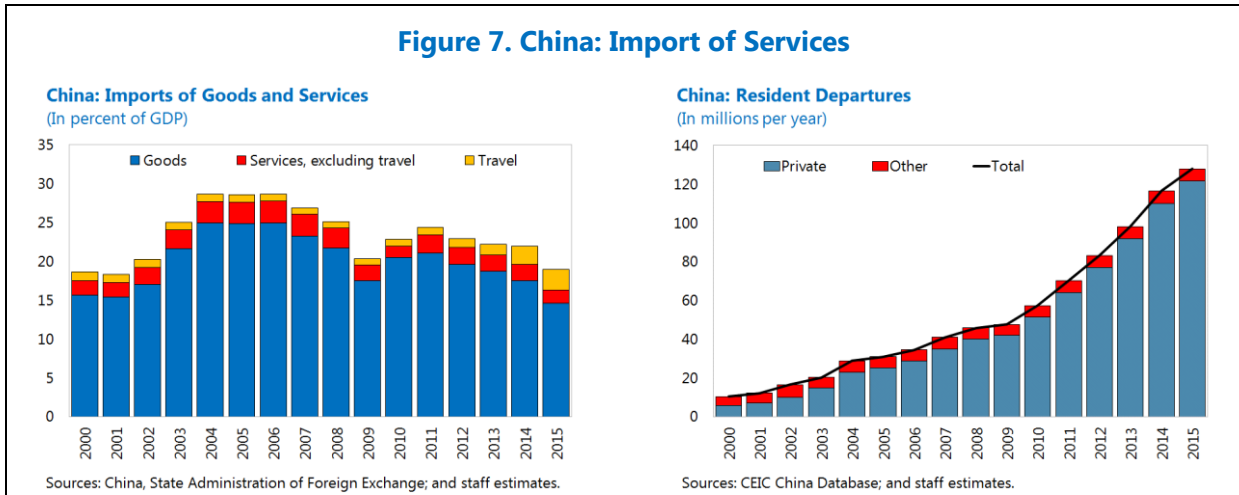


Value-added data confirm that mutual exposure to one another is similar to that to China for the ASEAN-5 economies, except for the Philippines, for which the exposure in value added terms to other ASEAN-5 economies is noticeably lower than that to China (Figure 6).



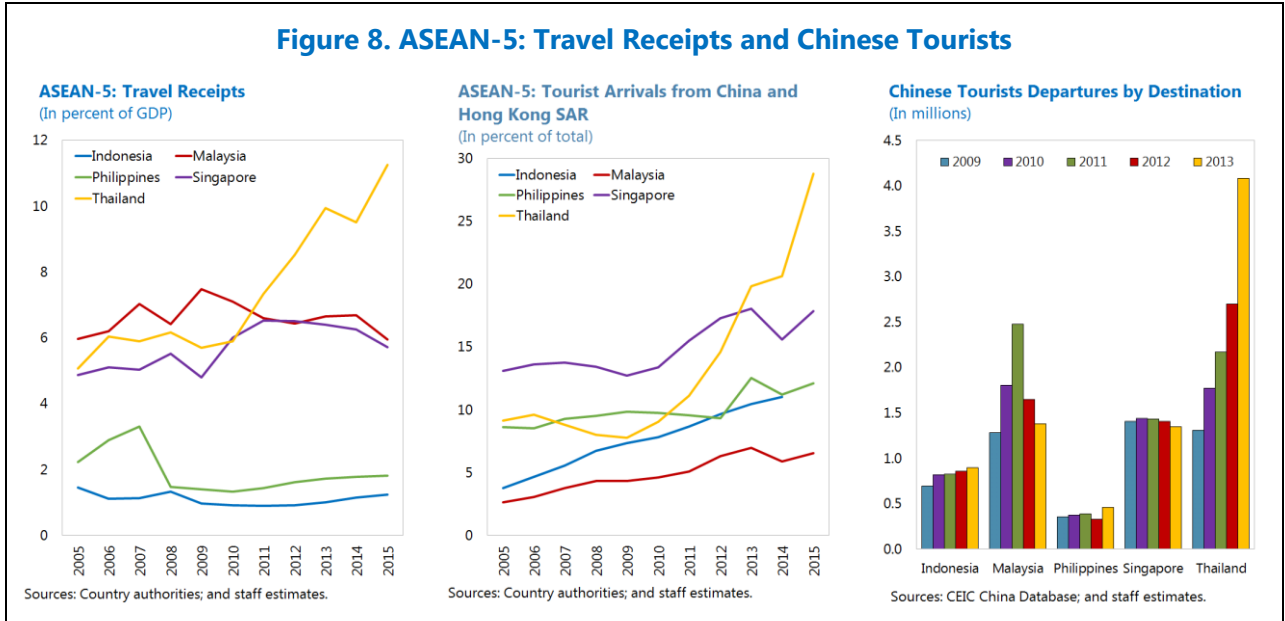
Trends on trade of services are more favorable for China's trading partners. As one aspect of China's rebalancing, its services imports have been growing in the last five years, including as percent of GDP, even as merchandise exports shrank relative to the size of the economy (Figure 7). Data on services trade is less detailed and reliable than that on goods trade, which is one of the reasons that most analysis focuses on merchandise trade. However, China's service imports amounted to 22 percent of merchandise imports (4 percent of GDP) in 2015, warranting attention to that sector. Moreover, more than half of service payments was accounted for by foreign travel—an activity for which detailed information is available, including from partner countries. This justifies a special focus on China's tourism, especially

given the exponential growth in the number of Chinese residents traveling abroad as reported by both the Chinese and destination country authorities.



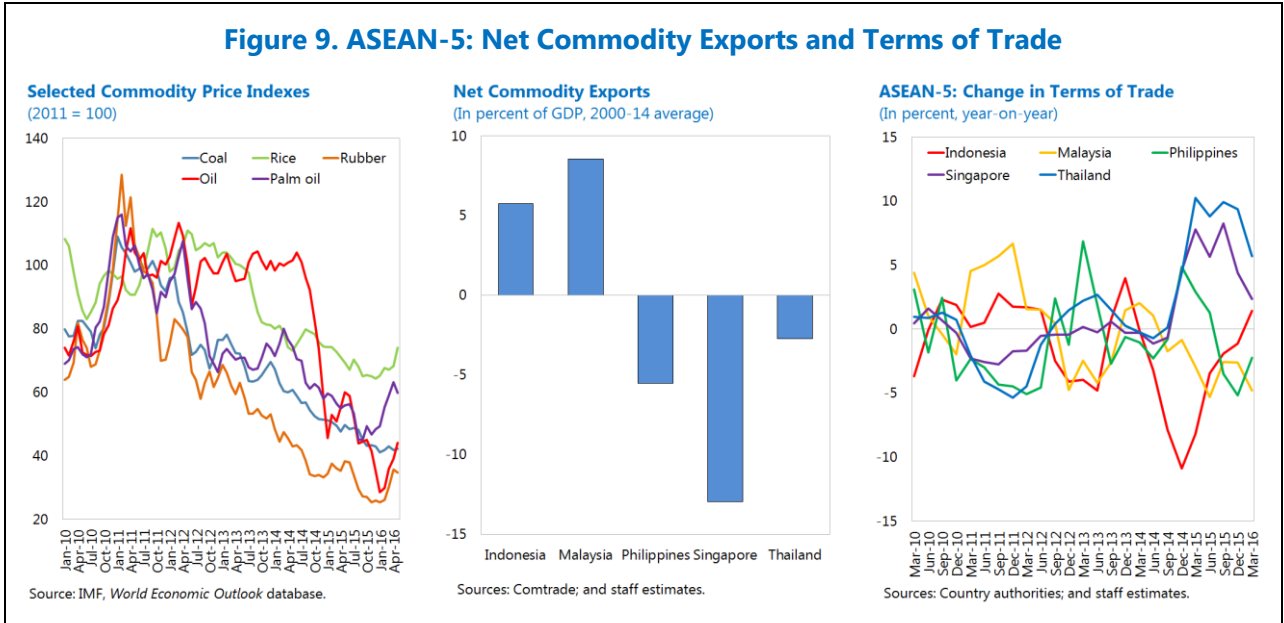
With China's growing middle class, this trend should continue even if the economy slows further. Countries with large tourism sectors, particularly those popular with the Chinese tourists, will benefit from that trend. While all ASEAN-5 countries have well-known tourist attractions, only in three of them—Malaysia, Singapore, and Thailand—tourism accounts for a large share of the economy (Figure 8). Among the three, Thailand stands out as the country where the sector has grown the most since 2010 and—not coincidentally—one that Chinese tourists find attractive.<sup>2</sup> Thailand remains well positioned to continue benefiting from the growing number of Chinese tourists.

<sup>2</sup> According to Chinese data, the number of Chinese tourists that visited Thailand in 2013 exceeded the number of visitors to the other four countries combined. However, nominal GDP in U.S. dollars in Thailand grew on par with Indonesia and considerably slower than in Singapore, Malaysia, and the Philippines between 2010 and 2014, somewhat inflating the ratio of tourism receipts to GDP.



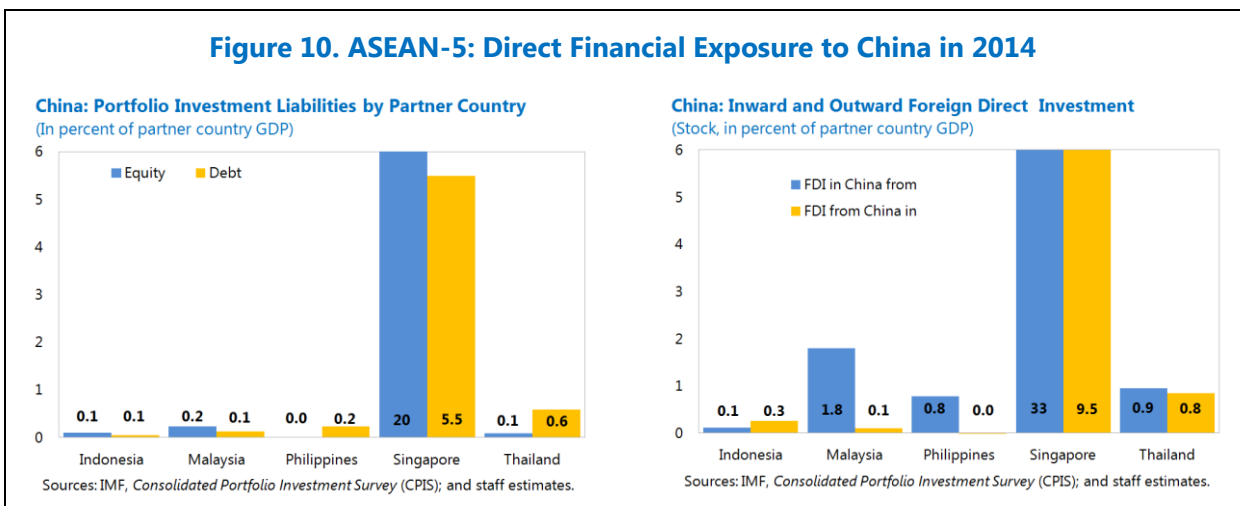
## B. Commodity Price Channel

China is a major player in commodity markets. For example, it accounts for 50 percent of the global demand for metals. Lower growth in China (and investment in particular)—along with increasing supply—has put downward pressure on the prices of fuel (including oil and coal), metals, and agricultural products (including rice and rubber; Figure 9). Oversupply has also played a role in the sharp fall in oil prices since late-2014. These trends in commodity prices have had a negative impact on the terms of trade of the ASEAN-5 net commodity exporters (Indonesia and Malaysia), but a positive impact on those of the net commodity importers (Philippines, Singapore, and Thailand). But the adverse shock to net commodity exporters partially spilled over to their trading partners (including the other ASEAN-5 economies) via lower demand and depreciated currencies. And even net commodity importers have large sectors (e.g., rice and rubber farming in Thailand) exposed to commodity price shocks.



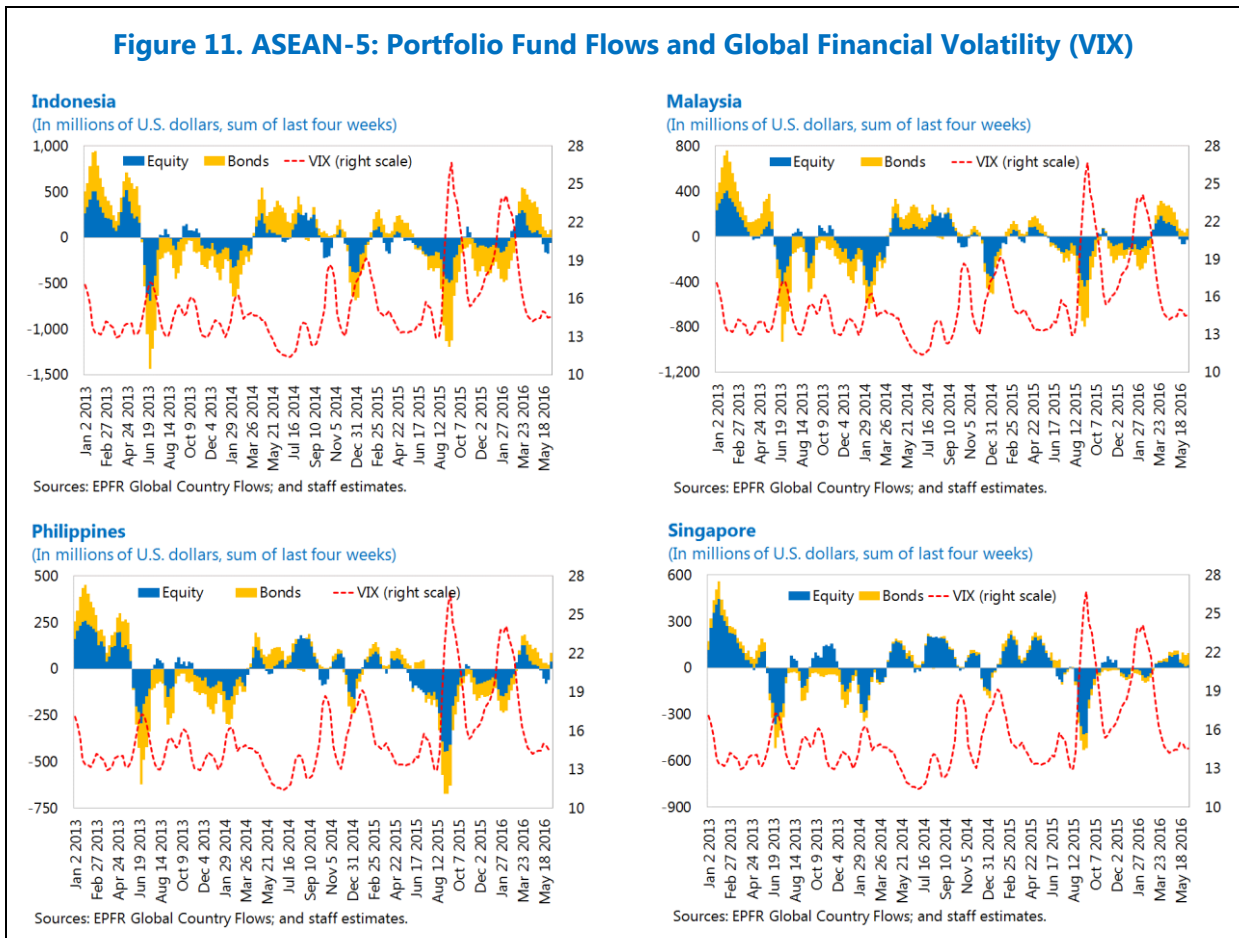
### C. Financial Channel

Except for Singapore, residents of ASEAN-5 have limited direct financial exposure to China. Bilateral linkages between China and Singapore via portfolio and foreign direct investment are large, although a material fraction of the investment in China via Singapore may originate in other countries. For the other ASEAN-5, the stocks of FDI and portfolio investment in China are less than 1 percent of GDP, while the stock of China’s FDI exceeds 1 percent of GDP only in Malaysia (Figure 10). However, financial exposure of the ASEAN-5 economies (excluding Singapore) to China could be larger if part of Singapore’s exposure to China corresponds to their investments in China through Singaporean financial institutions.



A likely more important financial spillover channel is the impact of developments in China on global financial conditions, which in turn affect local financial conditions in ASEAN-5. In

the past, spikes in the VIX have been associated with capital outflows, currency depreciation, and tighter domestic financial conditions in ASEAN-5 (IMF 2016b). Recently, uncertainty about the underlying strength of the Chinese economy led to spikes in the VIX in August 2015 and January 2016, and to capital outflows from the ASEAN-5 economies of similar size to those during the taper tantrum episode in mid-2013 (Figure 11).<sup>3</sup> Going forward, this could be an important spillover channel by itself and it could also amplify the spillovers through the trade and commodity price channels in all ASEAN-5 economies.



#### IV. POTENTIAL IMPACT OF CHINA'S SLOWDOWN AND REBALANCING ON THE ASEAN-5

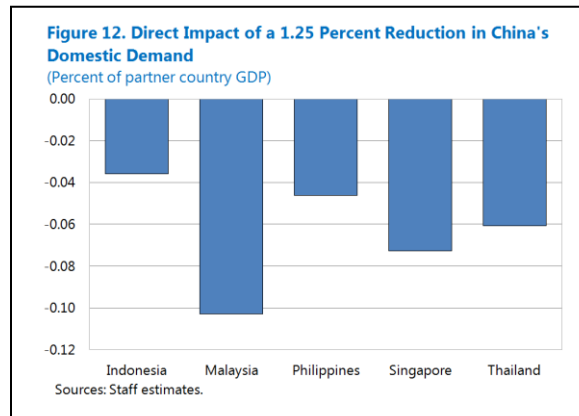
We use three approaches to quantify the potential impact of China's transition on its trading partners. The first one studies the first round effects through trade building on the exposures identified in the previous section. The second one empirically investigates the impact of a

<sup>3</sup> EPFR flows cover only mutual funds and do not account for the large bulk of other institutional investors. Balance of payment capital flow data suggests that Indonesia and the Philippines suffered smaller capital outflows during 2015 than during the taper tantrum episode in 2013.

slowdown in China using a Global Vector AutoRegressive (GVAR) model. The third one uses model-based simulations to assess the impact of alternative shocks that simultaneously generate a growth slowdown and economic rebalancing in China.

### A. First Round Effects through Trade

Suppose the only impact of a fall in China's domestic demand (relative to some baseline) were declines in the value added produced in various countries (including China itself) to satisfy that demand. With China's domestic value added embedded in final domestic demand accounting for 80 percent of China's GDP, a 1¼ percent decline in China's domestic demand would induce a 1 percent fall in China's GDP. Assuming an equivalent impact on China's trading partners, the fall in value-added in the ASEAN-5 economies would range from 0.04 percent in Indonesia to 0.1 percent in Malaysia (Figure 12).<sup>4</sup>



The impact of rebalancing from investment to consumption would be smaller than the impact of a fall in China's GDP by the same amount. Suppose 1 percent of GDP is reallocated from investment to consumption, lowering the former and increasing the latter by 2 percentage points. The impact ranges from essentially zero in Indonesia and Thailand to -0.02 percent in the Philippines and Singapore. Of course, one expects the decline in GDP growth in China to be in low single digits, while a redistribution from investment to consumption might be on the order of 10 percent of GDP or more, magnifying the effect. However, full rebalancing on that scale would likely take a few years to complete, thus spreading the effect over time. An increase in China's demand for consumption goods and services, particularly travel, not included in the above calculations, would mitigate the negative impact of rebalancing.

An illustrative transition scenario, combining a 2 percent fall in China's GDP triggered by a fall in domestic demand with a reallocation of spending from investment to consumption by 10 percent of GDP, would lower Indonesia's and Thailand's GDP by 0.1 percent, Malaysia's and the Philippines' by 0.3 percent, and Singapore's by 0.4 percent. These are not trivial amounts, even though they do not appear overly large, and a decline in ASEAN-5 GDP would only be a fraction of China's contraction.

It is important to note, however, that these calculations take into account only the direct, first-round impact of the shock. As a result of the shock, the incomes of those involved in the production chains feeding into China's domestic demand would decline. That, in turn, would

<sup>4</sup> The calculations are based on the value added numbers for 2011 from the OECD TiVA database.

reduce their demand for domestically produced goods and services and for imports, affecting those producers, and so on, amplifying the effect of the initial shock. Various adjustments and policy reactions may attenuate the impact – or exacerbate it further. In addition, China’s slowdown and rebalancing could depress commodity prices and disrupt financial markets, with differential impact across countries. Thus, the eventual incidence of the shock is likely to be larger on average than the initial impact, and not necessarily distributed in proportion to the countries’ direct trade with China. The exercise in this subsection cannot allow for this complexity. Empirical or theoretical models are needed to account for various linkages and behavioral relationships. We use both approaches to study this issue below.

## **B. Empirical Analysis**

To investigate and quantify the macroeconomic implications of China's slowdown for the ASEAN-5 economies, we employ a dynamic multi-country framework, first advanced by Pesaran and others (2004), known as the Global Vector AutoRegressive (GVAR) methodology. This framework has 26 region-specific models (including a Euro Area region comprising 8 of the 11 countries that adopted the euro in 1999). These individual models are solved in a global setting where core macroeconomic variables of each economy are related to corresponding foreign variables (constructed exclusively to capture each country's bilateral exposures to other countries through trade and financial linkages). The model has both real and financial variables: real GDP, inflation, real equity prices, the real exchange rate, short and long-term interest rates, and the price of oil. We also add, as an observable common factor, a financial stress index (FSI) to the GVAR to capture the impact of surges in global financial market volatility. We note that bouts of global financial market volatility could emanate from disorderly macro-financial developments in China (though we do not attempt to establish a causal link between the two).<sup>5</sup>

This topic has received considerable attention in recent years, with studies applying various techniques (VARs, Factor Augmented VARs, OLG and DSGE models, and event studies) to study the impact of a slowdown in China's (i) on its trading partners, for instance, Ahuja and Nabar (2012), Cesa-Bianchi and others (2012), and Duval and others (2014); (ii) on particular regions, Anderson and others (2015); or (iii) arising from particular sectors, Ahuja and Myrvoda (2012). However, most of these studies do not account for feedback effects or ignore the countries’ indirect exposure to shocks (through secondary or tertiary channels, such as third-country trade, financial, and commodity markets). We contribute to this literature by employing the GVAR methodology, considering both the temporal and cross-sectional dimensions of the data; real and financial drivers of economic activity; interlinkages and spillovers that exist between different regions; and the effects of unobserved or observed common factors (global financial stress and oil prices). This is crucial as the impact of shocks

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<sup>5</sup> See Cashin and others (2014, 2015, and 2016), Dees and others (2007), Chudik and Pesaran (2016), and Mohaddes and Raissi (2015) for details.

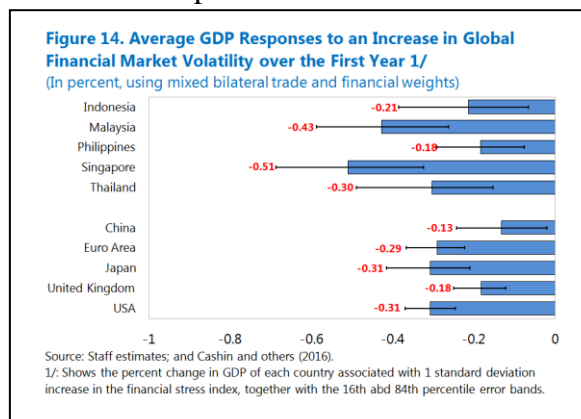
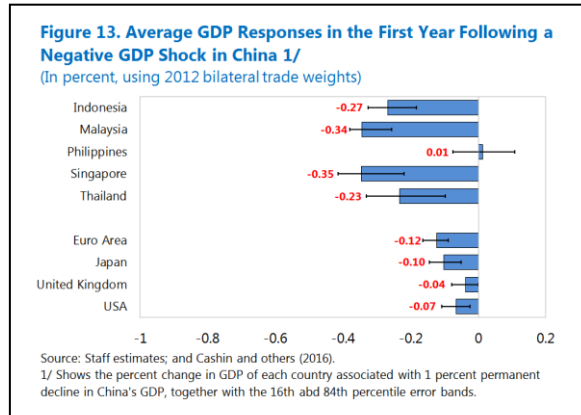


cannot be reduced to one country or region but rather involve multiple regions, and may be amplified or dampened depending on the countries' degree of openness and their trade and financial structures.

In a GVAR model estimated over the period 1981Q1 to 2013Q1, a negative GDP shock in China is found to have significant effects on the ASEAN-5 (except for the Philippines). The effects on other Asia-Pacific countries and systemic economies are smaller. Specifically, Figure 13 shows that a 1 percent permanent fall in China's GDP (equivalent to a one-off fall in China's GDP growth by 1 percentage point) would translate into lower global growth. The countries most exposed to China's growth slowdown are those within regional supply chains and commodity exporters. After one year, Malaysia's and Singapore's GDP would fall by 0.35 percent, while Indonesia's and Thailand's would fall by 0.3 and 0.2 percent, respectively. The impact on the Philippines is not statistically significant in part due to a low signal to noise ratio in the Philippines' data because of frequent boom-bust cycles in the past, as well as offsetting commodity price effects and stable remittances flows.

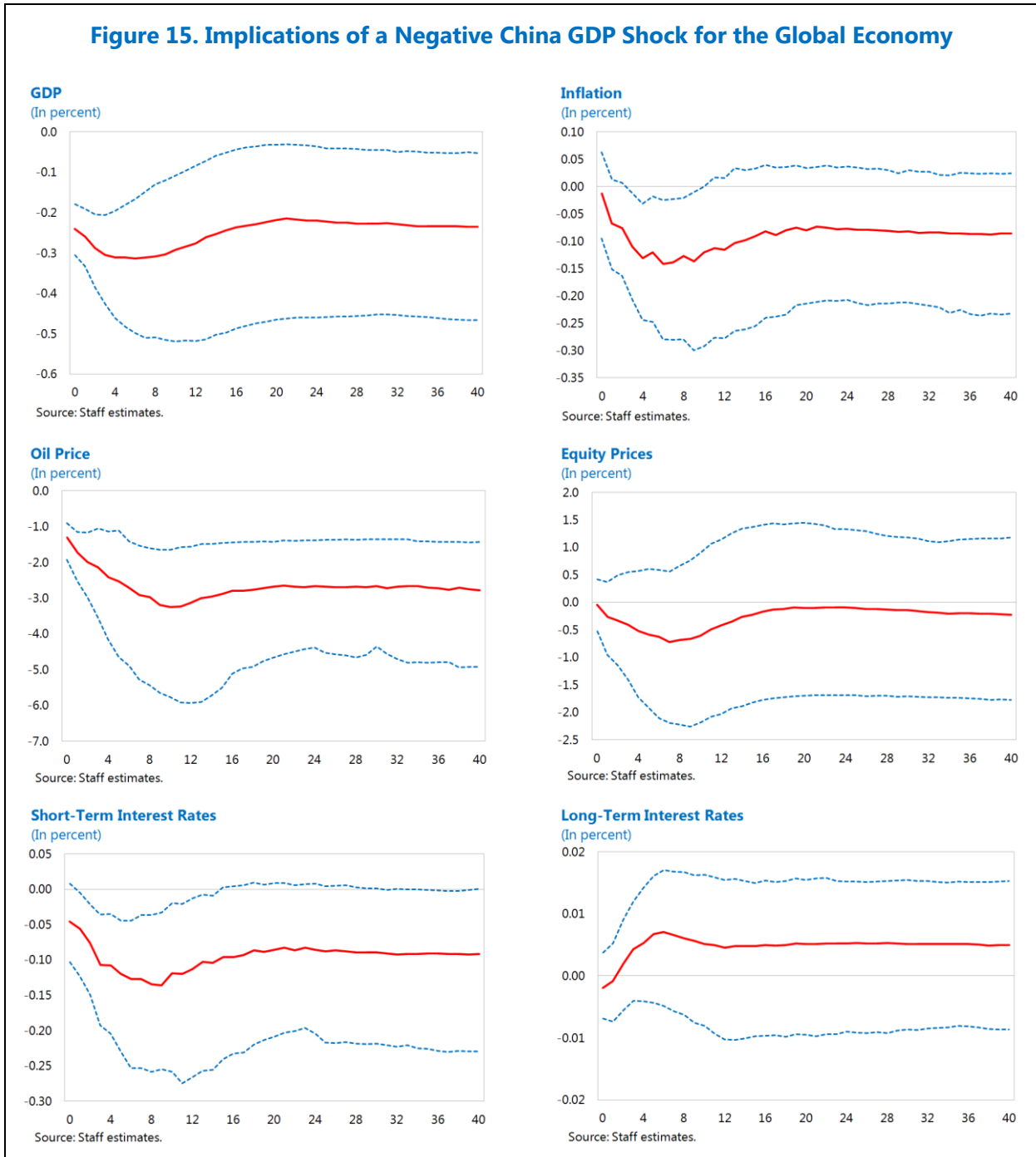
The effects on the Euro Area, Japan, the United Kingdom, and the United States are smaller.

If the shock to China's GDP coincides with a spike in global financial volatility (leading to tighter domestic financial conditions), the impact in most countries would be significantly larger. To account for this possibility, we examine separately the international spillovers of surges in global financial market volatility without trying to identify the cause of the shock. Figure 14 reports the output responses to a one standard deviation increase in the financial stress index<sup>6</sup> over the first year, together with the 16<sup>th</sup> and 84<sup>th</sup> percentile error bands. The results show significant heterogeneities across countries. In the ASEAN-5, output falls between 0.18 and 0.51 percent below the pre-shock level and the effects—operating through trade and financial linkages—are statistically significant for all countries. The commodity-price channel also leads to an adverse impact on economic activity in commodity exporters (Indonesia and Malaysia) as oil prices fall by about 6.5 percent in the first quarter.



<sup>6</sup> This index measures price movements relative to trend, with a historical average value of zero (implying neutral financial market conditions). The magnitude of the shock is comparable to the 2002 episode of market volatility in advanced economies and is much smaller than the Global Financial Crisis shock.

Our results suggest that following a one percent permanent decline in China's GDP, global growth (excluding China) falls by 0.23 percentage points in the short run and oil prices fall by around 3 percent in the long run. There is also some decline in both global inflation and short-term interest rates. The median effect on global equity prices is negative, but not statistically significant (Figure 15).



Empirical analysis should be complemented with model-based analysis. Empirical analysis has the advantage that is based on data and reflects historical relationships. But it may have limitations for the question at hand. In particular, it may not adequately capture the size of the current spillovers from China given the rapid growth and structural change of the Chinese economy over the past few years. A model-based approach, with an appropriate calibration of the model's parameters, may better capture the size of spillovers. Moreover, due to its micro structure, a model-based approach can analyze different shocks that would at the same time lower growth and rebalance China's economy. But model-based approaches also have limitations. The structure imposed by the model may be too restrictive and the parameters' calibration require judgement, creating margin for error.

### C. Model-Based Analysis

We use the IMF's Flexible System of Global Models (FSGM), which is a semi-structural, multi-region, general-equilibrium model. It includes several region-specific modules that encompass the global economy. Each module features an identical economic structure, but differs in its coverage of countries, key steady-state ratios, and parameterization to capture each region's economic characteristics. While the FSGM keeps solid micro-foundations in some blocks, it has less structure in others to improve tractability. Private consumption and investment have micro-foundations<sup>7</sup>, while trade, labor supply, and inflation have reduced-form representations. The model's potential output is determined by a production function with trend total factor productivity, the steady-state labor force, the non-accelerating inflation rate of unemployment (NAIRU), and the capital stock. There is a full stock-flow consistency in the model, and agents use model-consistent expectations. While monetary policy follows a standard reaction function, fiscal policy is anchored by a debt rule that assures long-run sustainability. See Andrieu and others (2015) for more details.

The channels through which spillovers from China operate depend on the factors behind the rebalancing and slowdown. Changes in private demand, supply factors, or the government's budget composition can spur the economic rebalancing and slowdown seen in the data.<sup>8</sup> We use the FSGM model to study how these adjustments would operate and examine separately their impact in each of the ASEAN-5 economies. In order to facilitate comparison with the GVAR results above, all shocks were calibrated to generate a 1 percentage point decline in China's growth in the first year relative to the baseline.

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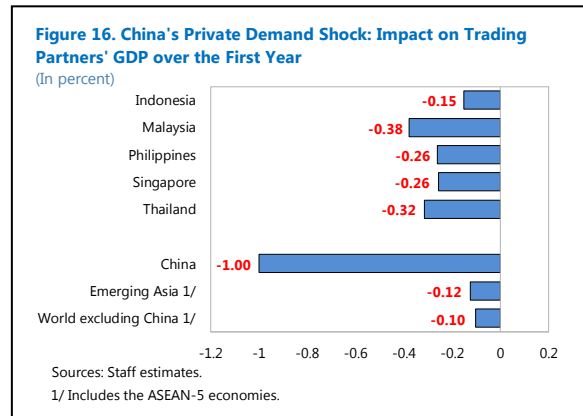
<sup>7</sup> The consumption block uses a discrete-time version of the Blanchard-Weil-Yaari overlapping generations model, based on a constant-elasticity-of-substitution utility function containing only consumption. There are also liquidity-constrained households, which do not have access to financial markets, and thus consume all their income each period. For private business investment we use an updated version of Tobin's Q model with quadratic real adjustment costs. The private business capital stock is chosen by firms to maximize profits.

<sup>8</sup> We do not attempt to exhaust all the possible explanations for this process, but rather discuss three sources of rebalancing that are already occurring to some degree.

### Scenario 1. Private demand shock: lower investment due to financial stress

Credit in China has risen rapidly and exceeds the level implied by economic fundamentals (IMF 2011). Although credit growth has moderated, the credit-to-GDP ratio remains high and the corporate sector continues to drive leverage. Thus, a possible private demand induced rebalancing scenario in China involves financial turbulence, including a fall in equity prices and a raise in the corporate risk premium.<sup>9</sup> Besides the 1 percentage point growth slowdown in China, this shock results in some rebalancing from investment to consumption since financial stress hits corporate profitability harder than household income.

Figure 16 shows the impact on China's trading partners in the first year. China's slowdown affects them through trade and commodity prices (there is no financial channel in FSGM). Countries with large direct trade links with China and commodity exporters have the largest spillovers. Among the ASEAN-5, Malaysia suffers the largest impact due both factors. In response to a 1 percentage point fall in China's growth, Malaysia's growth falls by 0.38 percentage points, Thailand's by 0.32 percentage points, Singapore's and the Philippines' by 0.26 percentage points, and Indonesia's by 0.15 percentage points. Even though the Philippines has low trade exposure to China, its major trading partners are also affected, amplifying the effect. Appendix I shows the medium-term effects of this shock.



Commodity prices also fall in response to this shock. Real oil and metal prices fall by 1.7 and 2 percent in the first year, respectively, and remain below the baseline in the long-run. Real food prices fall by 0.05 percent in the first year, recovering quickly afterwards. Countries that do not trade much with China and are net commodity importers have a mild negative impact or even benefit from China's slowdown. For example, growth in the United Kingdom and the United States falls by 0.05 percentage points in the first year, and their GDP levels increase above the baseline from the second year as they benefit from lower commodity prices.

### Scenario 2. Supply shock - lower productivity growth in the tradable goods sector

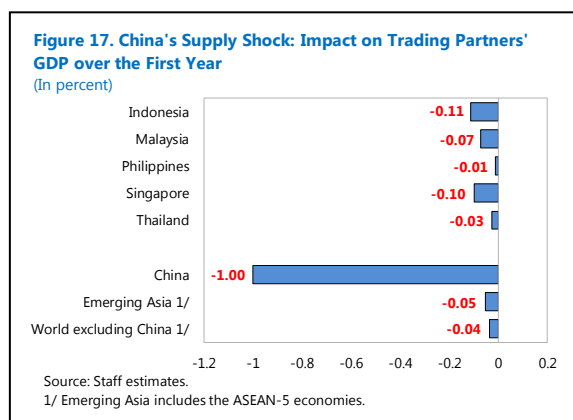
The share of industry in China's GDP is falling, while that of services is rising. This change in GDP composition will likely be accompanied by lower total factor productivity (TFP) growth in the tradable goods sector. We do not try to establish a causal relation between the two, but rather use their correlation to generate a supply-driven rebalancing. We assume a permanent slowdown in China's tradable goods sector TFP growth that economic agents

<sup>9</sup>We assume a zero interest rate floor for monetary policy for all countries in all our scenarios. Given the policy space contained in the World Economic Outlook, this constraint is binding only for the euro area and Japan.

foresee when making their consumption and investment decisions. The magnitude of the slowdown is calibrated so that GDP growth falls by 1 percentage point in the first year. The agents adjust their investment decisions taking into consideration this new outlook for TFP growth, generating some rebalancing from investment to consumption.

The fall in China's growth is more persistent in this scenario, but spillovers to other countries are smaller as China's imports fall by less. While China's real imports fall by 4 percent in Scenario 1, they only fall by 2 percent in this scenario. The import intensity of the variables driving China's slowdown explains the difference. In Scenario 1 the slowdown is driven by private investment, which has high import intensity, while the slowdown in this scenario is driven by exports, which have lower import intensity than private investment.

Spillovers to the ASEAN-5 economies are also smaller. Indonesia suffers the largest impact, with its growth falling by 0.11 percentage points in the first year due to a persistent fall in oil prices (Figure 17). Singapore's, Malaysia's, Thailand's, and the Philippines' growth decline by 0.1, 0.08, 0.04, and 0.01 percentage points, respectively. Real oil prices fall by 1 percent in the first year and 0.5 percent in the second year, stabilizing at 2 percent below the baseline in the long-run. Real metal prices fall by 1.8 percent in the first year and 0.5 percent in the second year, stabilizing at 2.5 percent below the baseline in the long-run. Lower oil prices hurt growth in the ASEAN-5 net oil exporters, but benefit the net commodity importers, partly offsetting the fall in trade with China. See appendix I for details on the medium-term impact of this shock.



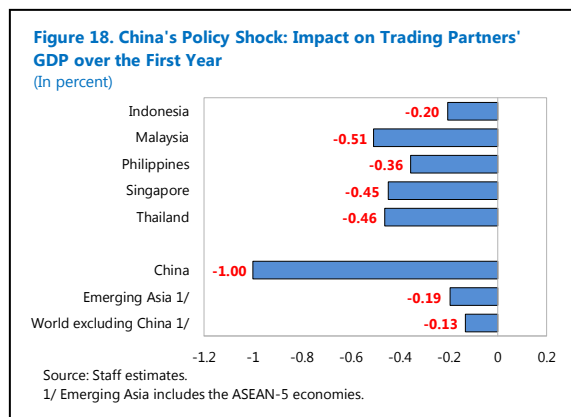
### Scenario 3. Policy shock: changes in the government's budget composition

This scenario analyzes the economic rebalancing induced by changes in the government's budget composition. China's authorities have strengthened the social safety net, including by the recent implementation of the hukou reform and new urbanization plans. Moreover, as population ages, the Chinese society will likely demand further strengthening of the pension and health insurance systems. The authorities want to introduce these reforms ensuring fiscal sustainability, which may include lowering relatively inefficient public capital spending. We implement this scenario in the FSGM through an increase in public general transfers that are fully funded by lower public investment. This change in the budget composition spurs private consumption, as households save less, and dampens investment, as public investment falls and positive productivity spillovers to private investment are reduced.

This scenario produces largest spillovers due to a larger fall in China's imports. As public investment has higher import content than private consumption, China's imports fall by

6 percent in the first year and are 2 percent below the baseline in the long-run. China's current account balance rises and its currency appreciates.<sup>10</sup> This scenario also generates the largest rebalancing. China's consumption increases by 10 percent above the baseline in the long-run, while China's investment rises only by 0.8 percent.

Spillovers to the ASEAN-5 economies are larger than in Scenarios 1 and 2. Malaysia, Singapore, and Thailand suffer the largest growth falls in the first year (0.5 percentage points) as China's growth declines by 1 percentage point (Figure 18). The fall in growth in the Philippines is slightly smaller at 0.36 percentage points. Indonesia is the least affected, with its growth declining only by 0.2 percentage points. See appendix I for the medium-term impact of this shock.



Commodity prices also decline more than in Scenarios 1 and 2. Real oil and metal prices fall by 2 percent in the first year and return to the baseline by the third year. Real food prices fall by 0.1 percent in the first year and remain there afterwards. Countries that do not trade much with China and are net commodity importers suffer a mild negative impact and quickly start benefiting from China's rebalancing. For example, growth in the United States and the Euro Area falls by less than 0.1 percentage point in the first year, and as they benefit from lower commodity prices, GDP rises above the baseline after the second year.

## Summary

Considering only the first round effects on trade from China's slowdown and rebalancing suggests that the impact on the ASEAN-5 economies would be modest. But empirical and model-based approaches find larger spillovers, particularly for countries with close trade links with China (Malaysia, Singapore, and Thailand) and commodity exporters (Indonesia and Malaysia).<sup>11</sup> Malaysia is consistently among those with largest spillovers in all scenarios due to its high trade and commodity price exposures, with growth falling between 0.4 and 0.5 percentage points in response to a 1 percentage point fall in China's growth. Singapore and Thailand are also highly affected, but less so as they are net commodity importers, with growth falling between 0.2 and 0.5 percentage points. Indonesia is less affected due to its limited direct trade exposure to China, with growth falling between 0.15 and 0.3 percentage points largely due to indirect effects through lower commodity prices. The picture is more mixed for the Philippines. While the empirical approach finds an insignificant impact, the

<sup>10</sup> As China's imports fall, the real exchange rate appreciates to keep the same NFA position in the steady state.

<sup>11</sup> The spillovers to ASEAN-5 are small only when China's slowdown is driven by a supply shock.

model-based approach finds larger impacts, ranging between 0.2 and 0.4 percentage points. The GVAR also shows that spikes in the VIX could have large effects in all the ASEAN-5 economies, particularly in those that have more open capital accounts (Malaysia, Singapore, and Thailand). The financial channel could also amplify the spillovers through trade and commodity prices if China's slowdown and rebalancing coincides with bouts of global financial market volatility.

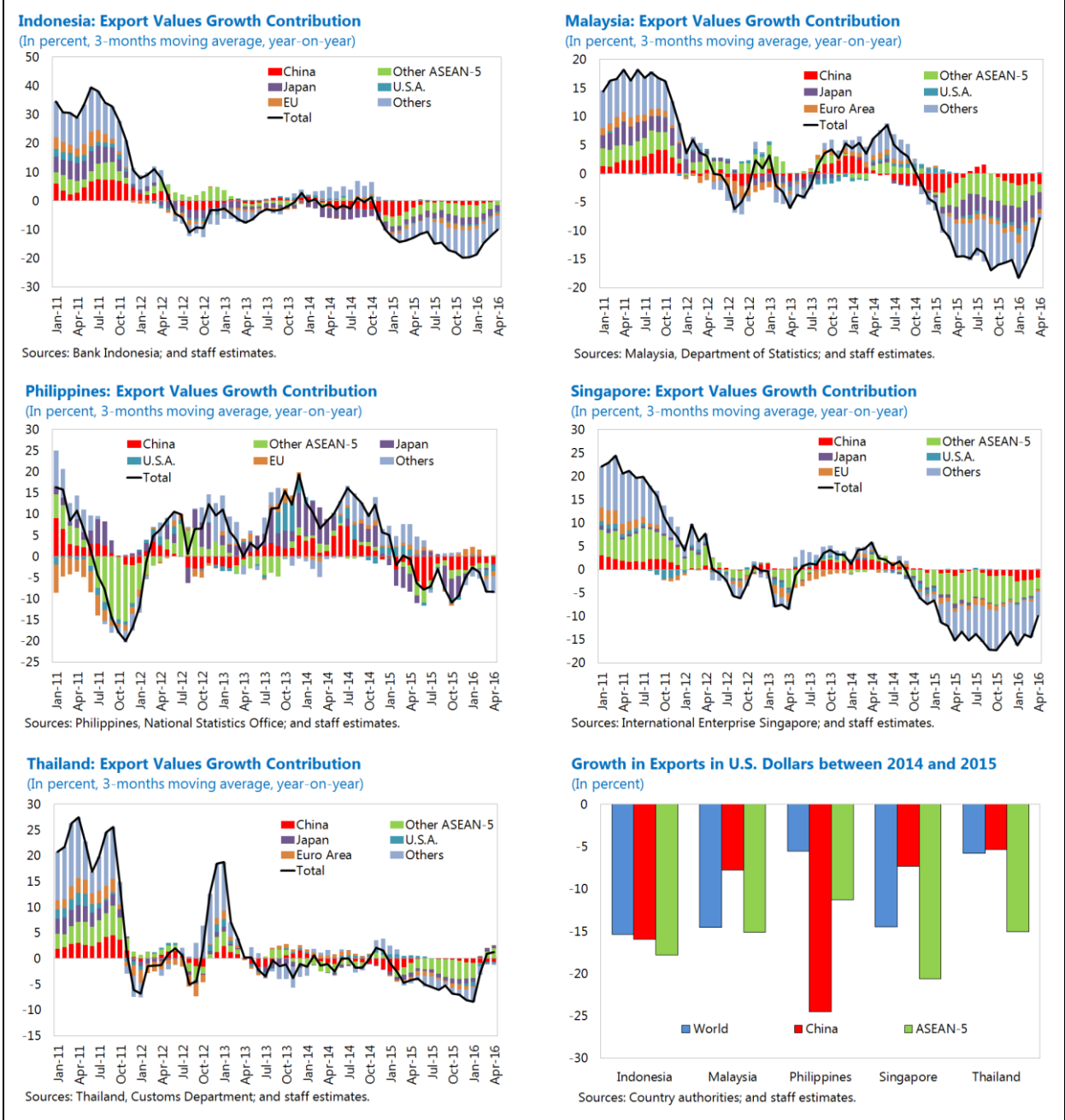
## **V. RECENT DEVELOPMENTS IN ASEAN-5**

Recent developments in the ASEAN-5 economies are broadly consistent with the findings above. ASEAN-5 goods exports have slowed since 2011, and declined significantly in 2015, coinciding with the slowdown and rebalancing in China. At the same time, commodity prices have fallen, hurting the commodity exporters. Domestic financial conditions have tightened in line with the tightening of global financial conditions. However, it is also apparent from the data that not all recent developments in ASEAN-5 are due to China. There are also other factors at play, including a global slowdown in international trade, idiosyncratic factors in commodity markets, and country-specific factors amplifying the impact of external shocks on domestic financial conditions, including political uncertainty in some cases.

### **A. Recent Merchandise Export Developments in ASEAN-5**

After a sharp rebound in the wake of the GFC, exports of goods in U.S. dollars slowed in all ASEAN-5 economies, and fell sharply in 2015 (Figure 19). Except for Thailand, the declines reached double digits. It should be noted, however, that except for the Philippines, exports to China account for only a small portion of the overall decline in export growth, particularly since mid-2015. The fall in exports to their ASEAN-5 partners has played a larger role—it appears that the ASEAN-5 countries are pulling one another down. But this may well reflect an amplification of the slowdown in trade with China that gets transmitted to other ASEAN-5 economies through ASEAN-5 trade links. Exports to Japan have also fallen significantly in Indonesia, Malaysia, and the Philippines.

**Figure 19. ASEAN-5: Contributions to Export Growth by Trading Partners**

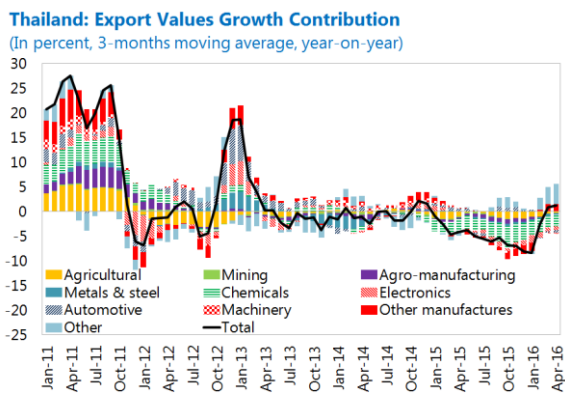
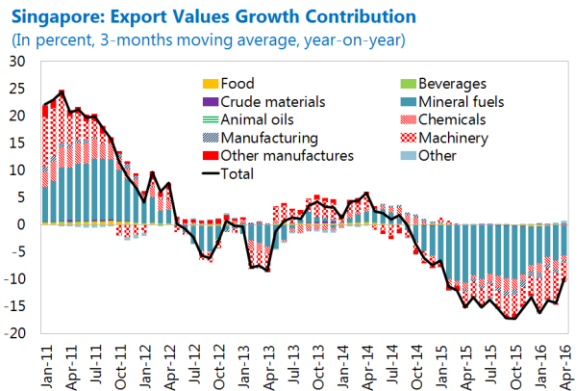
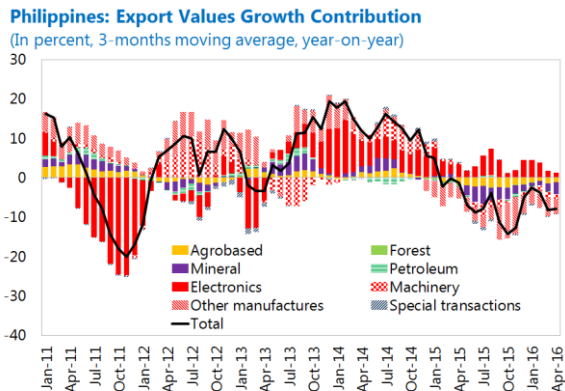
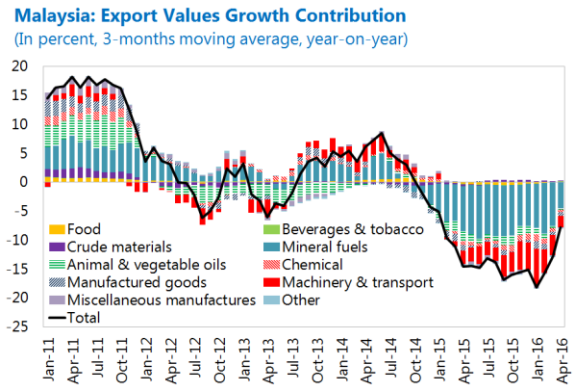
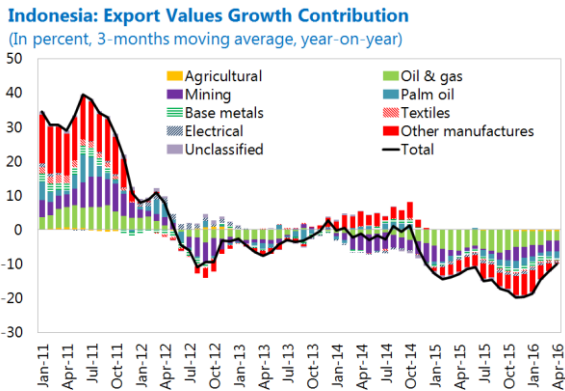


Lower commodity prices seem to explain only part of the fall in export values. We look at export values by broad categories to assess the role of commodity prices in the fall in export values. The data is from national sources and the groups are different across countries. We order the groups so that the first ones are those likely more intensive in commodities (up to the green striped bar), while the latter ones are likely more intensive in manufactured goods (Figure 20). The data shows that the fall in ASEAN-5’s export values in early-2015 was fully due to the commodity intensive groups, suggesting a large role for commodity prices. Since

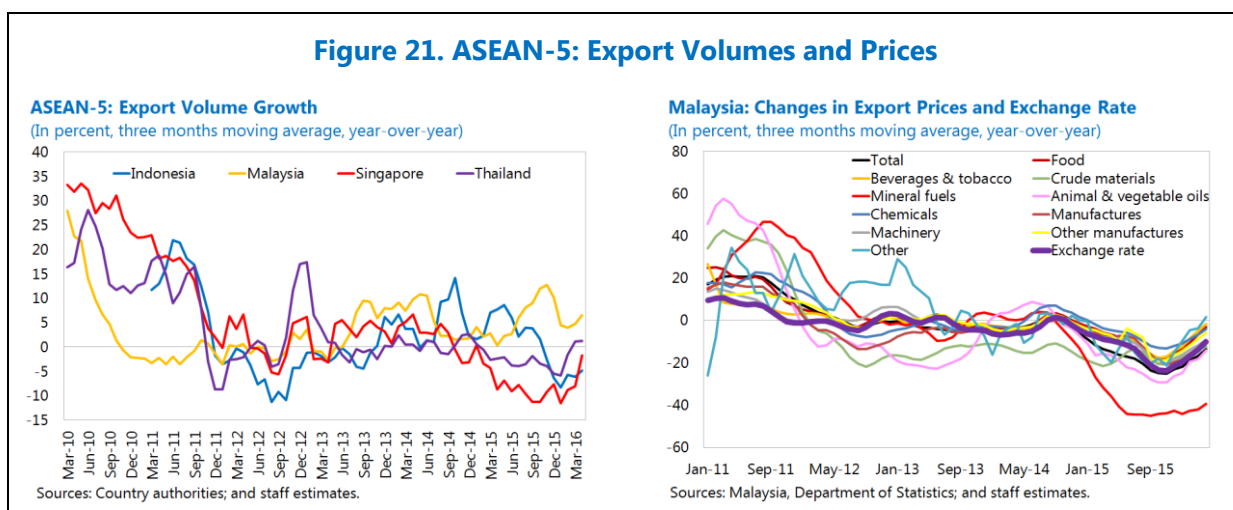


mid-2015, however, the fall in export values has been broader based, with the manufacturing groups also seeing sizable declines. The role of commodity prices is also apparent from the larger fall in export values for net commodity exporters (Indonesia and Malaysia) than for the Philippines and Thailand. The large fall in Singapore’s export values cannot be fully attributed to commodity prices.

**Figure 20. ASEAN-5: Contribution to Export Growth by Broad Economic Category**



The fall in ASEAN-5's export values in 2015 has been due to both volumes and prices. In Singapore and Thailand, lower export volumes accounted for half of the fall in export values in 2015 (Figure 21). In Indonesia, lower export prices accounted for all the decline in export values during the first three quarters of 2015, but volumes have also contributed afterwards. In Malaysia, lower export prices accounted for all the fall in export values since late-2014. Data by broad categories in Malaysia shows that export volumes of all categories have risen in 2015, with export prices in U.S. dollars falling broadly in line with the exchange rate, suggesting stable export prices in ringgit. Unfortunately there is no similar data for the other ASEAN-5 to see if this is a generalized phenomenon in the region.

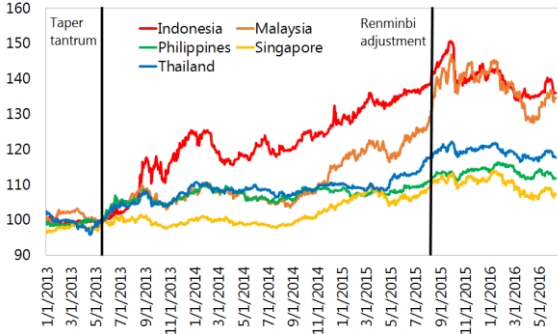


## B. Recent Financial Market Developments

Domestic financial conditions in the ASEAN-5 have tightened in line with the tightening of global financial conditions. The spike in the VIX prompted by the events in August 2015 triggered capital outflows, currency depreciation, stock market declines, and increases in CDS spreads in the ASEAN-5 economies (Figure 22). Malaysia saw the largest exchange rate pressure, with its currency depreciating the most despite sizable intervention. Indonesia also experienced pressures in August, but these eased after October as capital inflows resumed. In addition to the VIX, the impact on the ASEAN-5 currencies may have also reflected concerns about China getting competitive advantage via renminbi depreciation, and idiosyncratic factors such as declines in commodity prices for commodity exporters and political uncertainty in some countries. While supporting their competitiveness, currency depreciation in ASEAN-5 may put stress on the firms with significant foreign currency debt and lead to self-sustained capital outflows if depreciation expectations become entrenched.

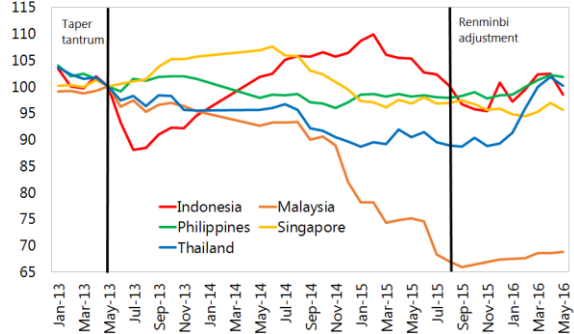
**Figure 22. ASEAN-5: Domestic Financial Conditions**

**Bilateral Exchange Rate versus the U.S. Dollar**  
(Index, May 22, 2013 = 100)



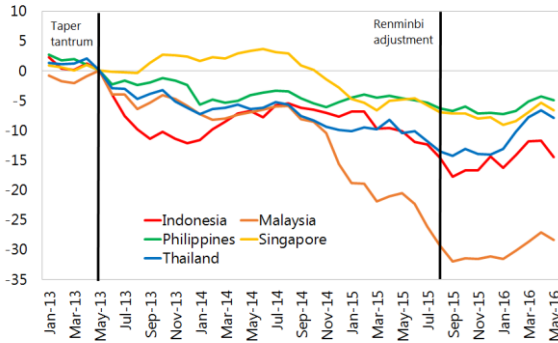
Sources: Country authorities; and staff estimates.

**International Reserves in U.S. Dollars**  
(Index, May 22, 2013 = 100)



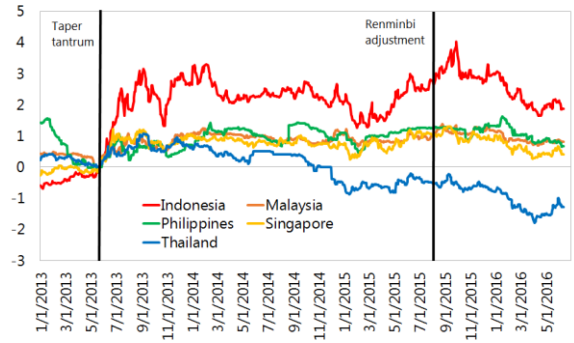
Sources: Country authorities; and staff estimates.

**Exchange Market Pressure Index**  
(May 2013 = 0)



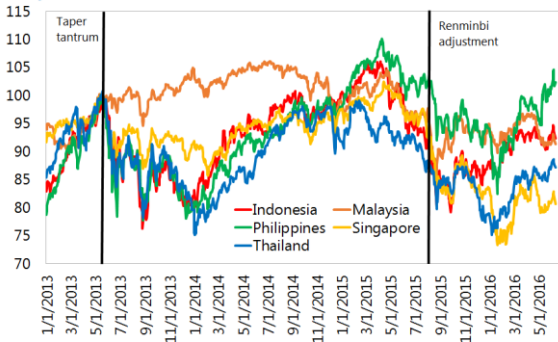
Sources: Country authorities; and staff estimates.

**Ten-Year Government Bond Yields**  
(In percent, May 22, 2013 = 0)



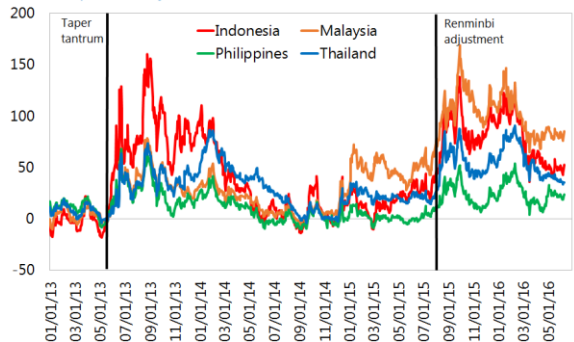
Sources: Country authorities; and staff estimates.

**Equity Price Index**  
(May 22, 2013 = 100)



Sources: Country authorities; and staff estimates.

**Credit Default Swaps (CDS) Spreads**  
(In basis points, May 22, 2013 = 0)



Sources: Country authorities; and staff estimates.

The tightening of domestic financial conditions at the time of poor trade performance and low commodity prices can amplify the impact. Tighter domestic financial conditions can reduce investment and domestic financial intermediation, weakening economic activity beyond the impact of lower exports and commodity price. As these processes play out in ASEAN-5's trading partners as well, they give rise to second round effects in many countries further depressing commodity prices and exports. Thus, as suggested by the GVAR results

above, spillovers to the ASEAN-5 economies from the growth slowdown and rebalancing in China could be larger if accompanied by heightened global financial volatility.

## VI. OPPORTUNITIES: GOODS TRADE REBALANCING AND TOURISM

China's transition also offers opportunities for the ASEAN-5 economies in both merchandise and services trade. For merchandise trade, we look at detailed exports data to assess whether China's rebalancing is having an impact on the composition of ASEAN-5 goods exports. We divide these exports into two groups. The first one, called "China a key importer," includes all those goods for which China's share in those exports is higher than the share of China in total exports from that country in that month. The second group, called "China not a key importer," includes all other goods exports. We then look at export growth for these two groups, splitting it into contributions from exports to China and to other markets.

Data on ASEAN-5 goods exports shows that China is changing the composition of its imports from the region (Figure 23). For Malaysia, the Philippines, and Thailand, exports to China have recently rebalanced away from traditional exports to goods that China did not import as much before. Moreover, the change seems to go beyond the simple rebalancing of Chinese imports, as ASEAN-5 economies are not only expanding their exports to China into new types of goods, but also gaining market share in those goods. This has not happened in Singapore, where exports to China of either type of goods are performing poorly. Data for Indonesia becomes available with a considerable lag, thus is not part of this analysis.

This rebalancing in exports to China is happening in a context of an overall rebalancing of exports in the Philippines and Thailand, but not in the case of Malaysia (Figure 24).

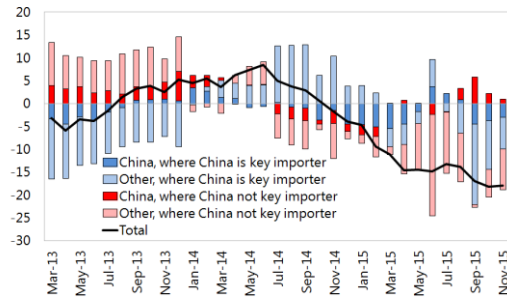
The weakness in traditional ASEAN-5 exports to China reflects mostly an overall drop in total Chinese imports of those goods.<sup>12</sup> In fact, all countries seem to be either keeping or gaining market share in overall Chinese imports of goods they have traditionally exported to China, except for the Philippines (Figure 25). Even more interesting, the strength of non-traditional exports to China goes beyond the overall performance of Chinese imports of those goods, except in the case of Thailand. Thus, this cannot be interpreted as China buying more of these goods from everyone but rather as a shift in the sourcing of these imports.

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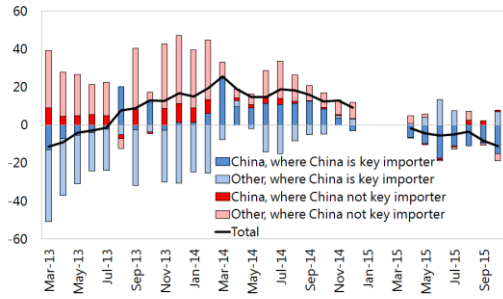
<sup>12</sup> Matching export data from each ASEAN-5 country and Chinese import data is not easy given differences in reporting of bilateral trade between China and its partners. Ideally, exports to China from COMTRADE should be used as Chinese imports as the rest of the analysis is done using ASEAN-5 export data from CONTRADE. But many countries have not reported their bilateral exports to COMTRADE for most of 2015. Thus, Chinese imports from national sources are used instead.

**Figure 23. ASEAN-5: Export Value Growth Contribution by Broad Groups**

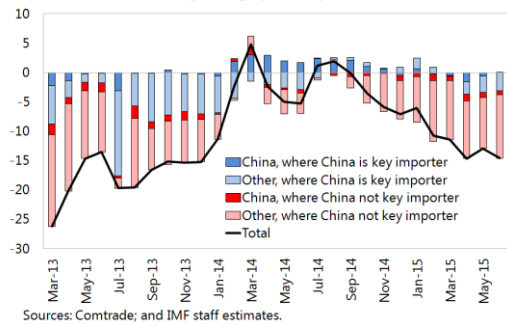
**Malaysia: Export Values Growth Contribution**  
(In percent, 3-month moving average, year-on-year)



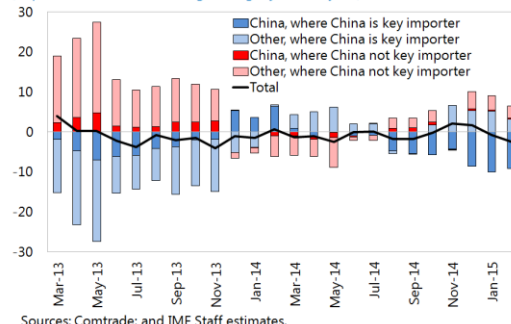
**Philippines: Export Values Growth Contribution**  
(In percent, 3-month moving average, year-on-year)



**Singapore: Export Values Growth Contribution**  
(In percent, 3-month moving average, year-on-year)

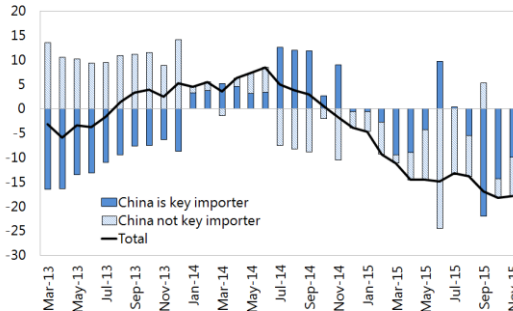


**Thailand: Export Values Growth Contribution**  
(In percent, 3-month moving average, year-on-year)

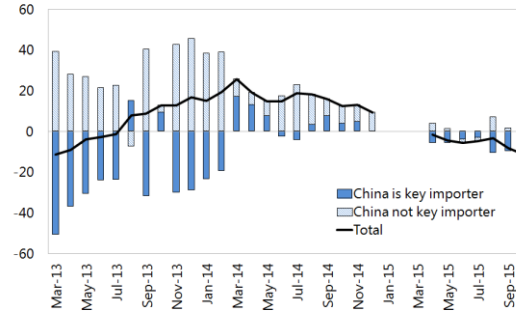


**Figure 24. ASEAN-5: Export Value Growth Contribution by Broad Groups**

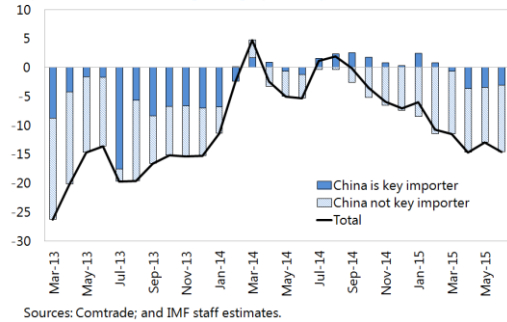
**Malaysia: Export Values Growth Contribution**  
(In percent, 3-month moving average, year-on-year)



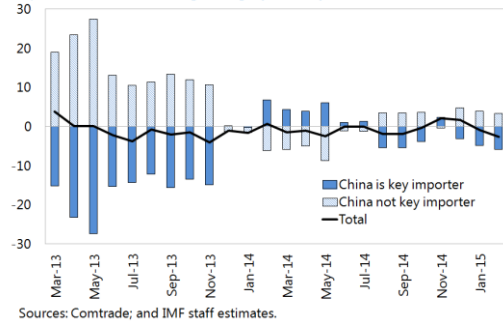
**Philippines: Export Values Growth Contribution**  
(In percent, 3-month moving average, year-on-year)



**Singapore: Export Values Growth Contribution**  
(In percent, 3-month moving average, year-on-year)



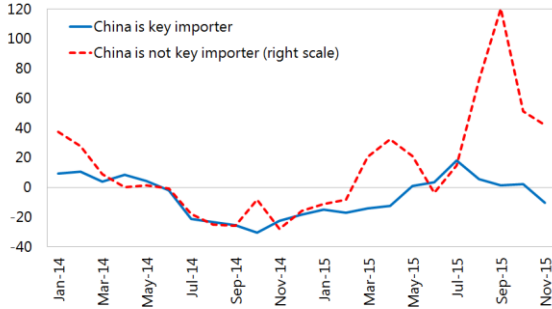
**Thailand: Export Values Growth Contribution**  
(In percent, 3-month moving average, year-on-year)



**Figure 25. ASEAN-5: Growth Differential between a Country's Exports to China and China's Imports**

**Malaysia: Growth Differential between Malaysia's Exports to China and China's Imports**

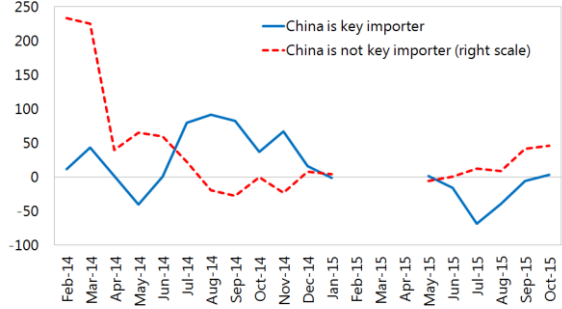
(In percent, 3-month moving average, year-on-year)



Sources: Comtrade; and IMF staff estimates.

**Philippines: Growth Differential between Philippines' Exports to China and China's Imports**

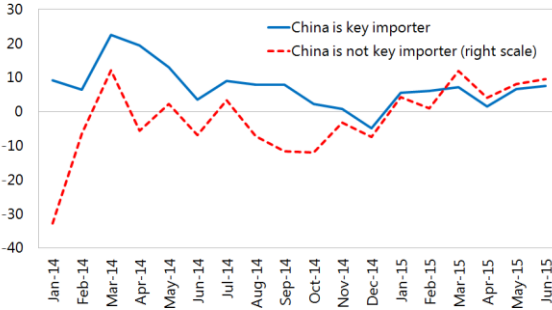
(In percent, 3-month moving average, year-on-year)



Sources: Comtrade; and IMF staff estimates.

**Singapore: Growth Differential between Singapore's Exports to China and China's Imports**

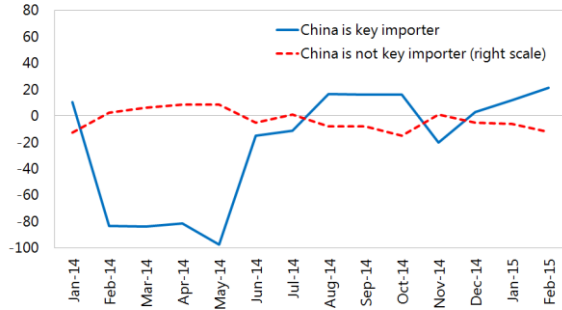
(In percent, 3-month moving average, year-on-year)



Sources: Comtrade; and IMF staff estimates.

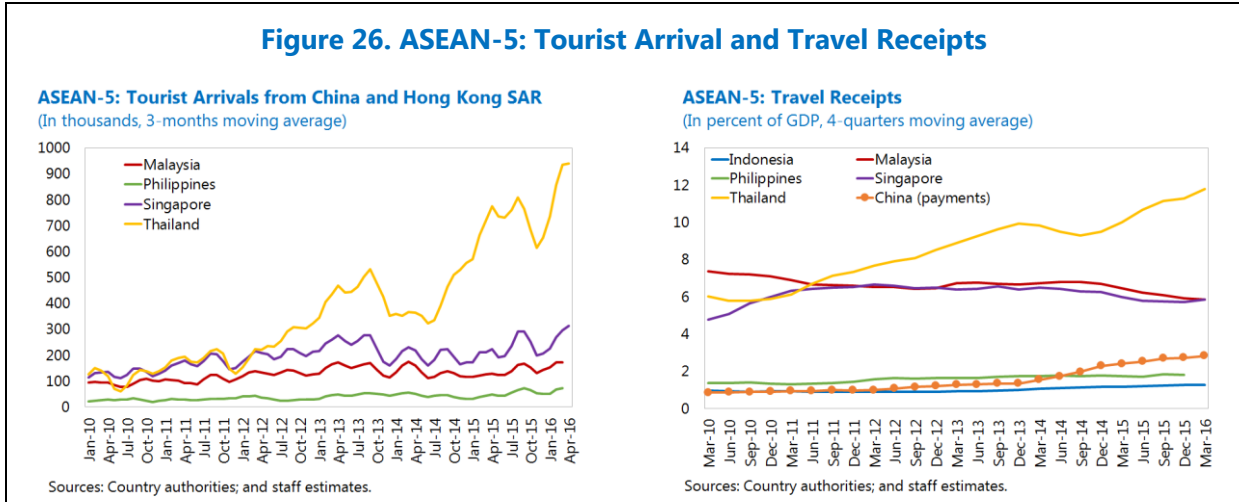
**Thailand: Growth Differential between Thailand's Exports to China and China's Imports**

(In percent, 3-month moving average, year-on-year)



Sources: Comtrade; and IMF staff estimates.

China's rebalancing away from investment and towards consumption has not only increased its demand for consumption goods, but also its imports of services such as foreign travel. Regarding services exports in the ASEAN-5 economies, monthly data on tourism confirm that the trend increase in Chinese visitors to the region was sustained in 2015 and early-2016, with Thailand remaining a standout (Figure 26). In terms of spending, the spike in Chinese travel payments had the most visible impact on Thailand relative to GDP. In Malaysia, the ringgit depreciation likely dented the dollar value of tourism receipts.



## VII. CONCLUSION

The ASEAN-5 economies benefited for a long time from the strong growth of the Chinese economy. Now China is transitioning to a new model, with slower but more sustainable growth, which should be beneficial for the domestic and global economy over the medium term, but will generate negative spillovers to its trading partners in the near term. These spillovers would transmit through three channels: trade, commodity prices, and financial markets. Countries more exposed through any of these channels are likely to be more affected by the growth slowdown and rebalancing of the Chinese economy.

This paper shows that China is an important trading partner for the ASEAN-5 economies, but it does not play a dominant role. Exposure to China's domestic demand through value added trade varies from 3 percent of GDP in Indonesia to 8 percent in Malaysia. This suggests that it would take a very large fall in China's demand to lower GDP in the ASEAN-5 economies by 1 percent if only the direct effect is in operation. Similarly, while a rebalancing from investment to consumption would have a negative impact on all the ASEAN-5 economies (except for Thailand) as their exports are linked more to the former than to the latter, the scale of rebalancing would have to be substantial for that difference to be felt. That may well turn out to be the case, but the adjustment is likely to be drawn over a number of years, with fairly marginal impact on GDP growth in the affected countries in any given year.

This analysis, however, ignores various interactions through domestic multipliers, third-party trade, policy reactions, and commodity and financial flows that can amplify or attenuate the direct impact. Empirical and model-based analyses, which account for these indirect effects, indicate that spillovers to ASEAN-5 from China's slowdown and rebalancing can be large. Countries with closer trade linkages to China (Malaysia, Singapore, and Thailand) and net commodity exporters (Indonesia and Malaysia) would be hit hardest. Malaysia is consistently among those with larger spillovers, with growth declining between 0.4 and 0.5 percentage points in response to a 1 percentage point fall in China's growth, depending on the model

used and the nature of the shock. Singapore and Thailand are also highly affected, with falls in growth ranging between 0.2 and 0.5 percentage points. Indonesia and the Philippines are less affected due to more limited trade linkages with China. Empirical analysis also suggests that the spillovers could be substantially larger if China's slowdown and rebalancing is accompanied by an increase in global financial market volatility.

Recent developments in the ASEAN-5 economies are broadly consistent with the findings above. ASEAN-5 goods exports have slowed since 2011, and declined significantly in 2015, coinciding with the slowdown and rebalancing in China among other factors, and commodity prices have fallen, hurting the net commodity exporters. Domestic financial conditions have tightened in line with the tightening of global financial conditions. Although growth has slowed in the ASEAN-5 economies in recent years, it has remained robust in most of them due to the strength of domestic demand. It is also apparent from the data that not all recent developments in the ASEAN-5 economies are due to developments in China. There are also other factors at play, including a global slowdown in international trade, idiosyncratic factors affecting commodity markets, and country specific factors amplifying the impact of external shocks on domestic financial conditions, including political uncertainty in some cases.

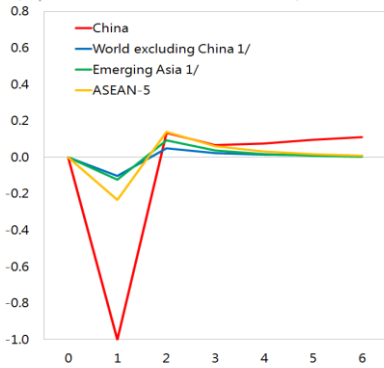
There are also opportunities from China's rebalancing for the ASEAN-5 economies. China's imports are shifting away from traditional goods linked to industrial activity towards consumption goods. There is already preliminary evidence that ASEAN-5 exporters are gaining market share in the latter segments, and this could become a new engine of export growth for the ASEAN-5 economies. China's imports of services are also rising, particularly in tourism, with foreign travel of Chinese nationals growing exponentially in recent years. Thailand is particularly benefiting from this trend and should continue to do so. Other ASEAN-5 economies could also benefit from this trend if they effectively market their tourist attractions in the Chinese market.



## Appendix I: Impact of a Shock in China to Private Demand (Scenario 1), Tradable Supply (Scenario 2), and Government's Budget Composition (Scenario 3)

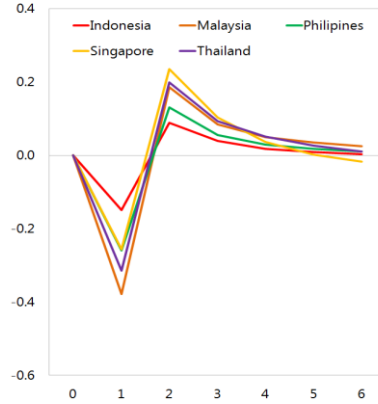
### Model-based Simulations: Medium-term Impact

**Scenario 1. China and the World Economy: GDP Growth**  
(In percent, deviations from the baseline)



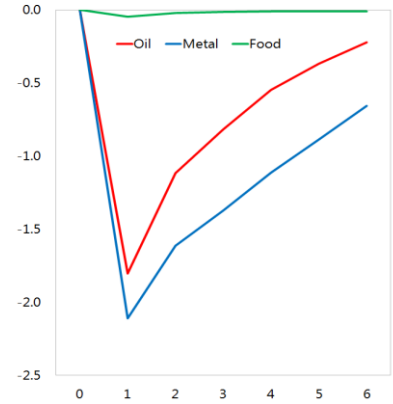
Source: Staff estimates.  
1/ Includes the ASEAN-5 economies.

**Scenario 1. ASEAN-5: GDP Growth**  
(In percent, deviations from the baseline)



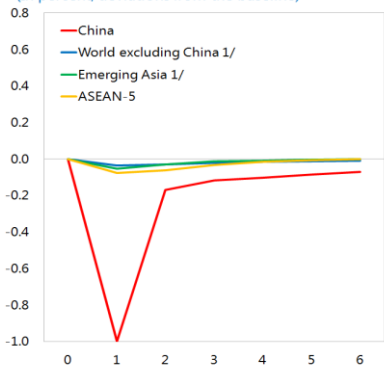
Source: Staff estimates.

**Scenario 1. Real Commodity Prices**  
(In percent, deviations from the baseline)



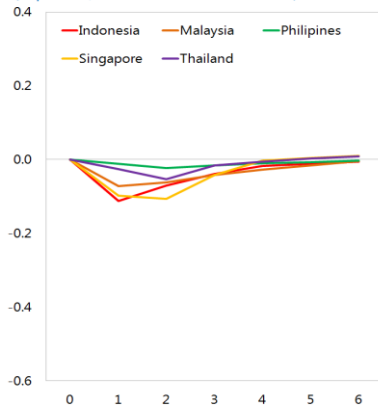
Source: Staff estimates.

**Scenario 2. China and the World Economy: GDP Growth**  
(In percent, deviations from the baseline)



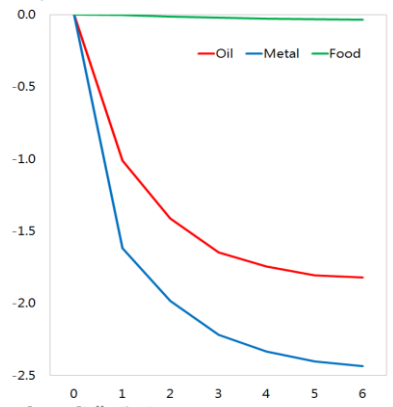
Source: Staff estimates.  
1/ Includes the ASEAN-5 economies.

**Scenario 2. ASEAN-5: GDP Growth**  
(In percent, deviations from the baseline)



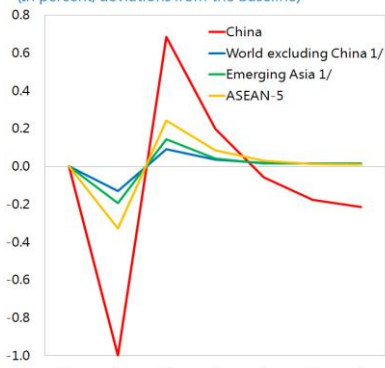
Source: Staff estimates.

**Scenario 2. Real Commodity Prices**  
(In percent, deviations from the baseline)



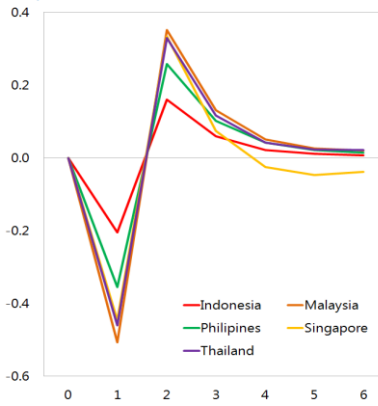
Source: Staff estimates.

**Scenario 3. China and the World Economy: GDP Growth**  
(In percent, deviations from the baseline)



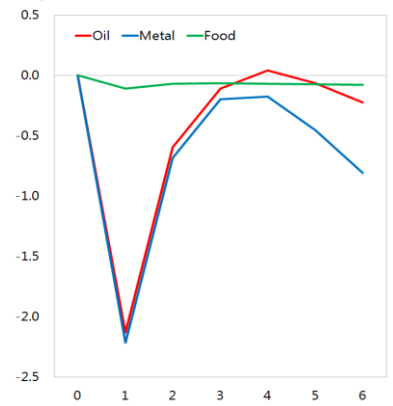
Source: Staff estimates.  
1/ Includes the ASEAN-5 economies.

**Scenario 3. ASEAN-5: GDP Growth**  
(In percent, deviations from the baseline)



Source: Staff estimates.

**Scenario 3. Real Commodity Prices**  
(In percent, deviations from the baseline)



Source: Staff estimates.

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