Special Report – Economics
Asia growth: Who matters most?

Highlights

- In this report, we analyse which of the major economies matters most for growth in Asia excluding Japan and China. We find that while the US and the euro area are larger economies than China at market prices, China’s faster pace of growth means its impact is greater. After all, momentum is mass times velocity.

- We look at export shares, sources of final demand, and the evolution of economic linkages over time to assess the relative influence of the major economies (China, the US, Europe and Japan). We conduct an impulse response analysis to quantify the impact on Asian economies of a growth shock in the majors.

- While we find that China is Asia’s most important export market, its dominance is less significant when we look at final demand rather than conventional direct export data. Our impulse response analysis is consistent with this finding.

- We examine the relative impact of the majors on the following 10 economies: Australia, Hong Kong, India, Indonesia, Malaysia, the Philippines, Singapore, South Korea, Taiwan and Thailand.
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Infographics

Figure 1: China is the biggest source of final demand for Asia, but not as big as direct exports suggest

One square container = 1ppt of total exports

While China is the most important export destination for Asia, conventional trade relationships overstate its influence relative to other major economies. For example, a significant portion of Korea’s exports from Korea to China are ultimately bound for other destinations. In terms of final demand, we estimate that our sample economies export 1.3x more to China (as a percentage of their GDP) than to the US, the EU or Japan on average, while the difference for direct exports is 2.3x.

Gross exports as % of country’s total exports (2014)

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Final demand as % of country’s total exports (2011)

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<th>China</th>
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Note: AXCJ refers to our sample of Asia ex-Japan and China economies; ID = Indonesia, MY = Malaysia, PH = Philippines, SG = Singapore, TH = Thailand, HK = Hong Kong, KR = South Korea, TW = Taiwan, IN = India, AU = Australia

Source: OECD-WTO database, Standard Chartered Research
Figure 2: China’s absorption of direct exports from the rest of Asia underlines its status as the factory of the world

Gross exports to major economies, USD bn

Source: IMF, Standard Chartered Research
China’s economic influence in Asia has increased significantly since 2011, while the US’ influence has diminished since the global financial crisis. But these relationships remain dynamic and their relative influence could shift again if the US continues to recover and China continues to slow.

The change in GDP presents a clear view of the rapid pace of China’s growth. China grew more than the US, the euro area and Japan in the 2005-10 and 2010-15 periods.
Figure 5: China’s consumer is smaller but has increased consumption more

x-axis: change in nominal consumption over the time period (USD bn); y-axis: average nominal consumption during the time period (USD bn)

While US consumption still has the biggest influence on Asia’s growth, China’s consumer is growing fast. We also found that consumption in China is more correlated than investment in China with Asia’s growth. With China aiming to boost consumption, exporters will need to adjust their strategies to meet this new demand.

Source: CEIC, Standard Chartered Research
Figure 6: We estimate how vulnerable Asia’s growth is to the majors

One dot = one basis point of GDP impact

We apply a generalised impulse response function to determine the reaction of Asian economies to a growth shock in the majors. Singapore, Hong Kong, Taiwan, Thailand and Malaysia are more vulnerable to external growth shocks. For example, a 1ppt y/y negative shock from the US is estimated to decrease Singapore’s growth by 1.65ppt y/y.

*India (for a US shock) and Indonesia (for shocks in all four majors) have an inverse impact from the shock; Source: CEIC, Standard Chartered Research
Figure 7: Smaller open economies are most exposed to the variability of growth in major economies

Source: CEIC, Standard Chartered Research

Figure 8: China poses the largest growth risk given its high growth rate

Source: CEIC, Standard Chartered Research
Figure 9: Applying a US growth shock
impact of a 1ppt y/y change in growth in the US

Source: CEIC, Standard Chartered Research

Figure 10: Applying a China growth shock
impact of a 1ppt y/y change in growth in China

Source: CEIC, Standard Chartered Research

Figure 11: Applying a euro-area growth shock
impact of a 1ppt y/y change in growth in the euro area

Source: CEIC, Standard Chartered Research
**Figure 12: Applying a Japan growth shock**

*Impact of a 1ppt y/y change in growth in Japan*

Source: CEIC, Standard Chartered Research

**Figure 13: US slowdown to affect small, open economies; euro area to provide support, based on our 2015-16 growth forecasts**

*US, China, euro area and Japan impact on GDP levels, ppt*

Source: Standard Chartered Research

**Figure 14: Measuring the impact of a simultaneous growth shock to all majors on our sample economies**

*US, China, euro area and Japan’s impact on AXJC GDP levels, ppt*

Note: We use Asia GDP-weighted averages of the shock impact on growth in 10 Asian economies; Source: Standard Chartered Research
Overview – China matters most for growth

Momentum = Mass x Velocity

The influence of one economy on another can be measured in multiple ways. The simple but powerful principle from physics that momentum equals mass times velocity is particularly relevant here. While the US and the euro area are larger economies than China at market prices, China’s faster pace of growth means its impact is greater (see Figures 1-3).

We examine the relative influence of China, the US, the euro area and Japan on the 10 economies in our sample: Australia, Hong Kong, India, Indonesia, Malaysia, the Philippines, Singapore, South Korea, Taiwan and Thailand. We assess the impact on these economies’ growth, consumption, investment, tourism and FDI using export shares, sources of final demand and the evolution of economic linkages over the past 15 years (by estimating rolling betas). We also conduct an impulse response analysis to quantify the likely impact on these economies of a -1ppt GDP growth shock to the four major economies.

This report builds on our earlier analysis (On the Ground, 31 July 2013, ‘US versus China – Who matters more in Asia?’). That report, which focused on the relative influence of the US and China, found that Hong Kong, Taiwan, Singapore and Korea were more influenced by China while the US mattered more for the Philippines, India, Indonesia and Thailand.

Figure 1: China’s influence moderates when final demand is taken into account

Exports and origin of final demand in % of GDP; impact in ppt of GDP

<table>
<thead>
<tr>
<th>Exports as percent of GDP (%)</th>
<th>Origin of final demand (%)</th>
<th>Impact* (ppt)</th>
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*Impact of 1ppt shock to majors: India (for a US shock) and Indonesia (for shocks in all four majors) have an inverse impact to the shock; *Hong Kong exports as % of GDP of the majors curtailed to 100% from 125%.

Source: Standard Chartered Research
Overview

The following are the key conclusions of our latest study:

- China continues to rise in importance, despite its current economic slowdown and the ongoing transformation of its growth model. Our rolling sensitivity analysis shows that China’s economic impact on our sample economies has grown consistently since 2011.

- However, the widely accepted importance of China’s impact is not as great as direct export exposure suggests. China is the largest and fastest-growing export market for the countries in our study in aggregate, in terms of both direct exports and final demand. But when we account for final export demand (stripping out exports of intermediate goods to China that are ultimately destined for other countries, and including services exports), the relative importance of the US and the euro area increases.

- When we model the impact of a -1ppt growth shock to the US, China, the euro area and Japan, the US slowdown has the greatest impact. However, in a more extreme scenario of a halving of major economies’ growth rates, China has a much bigger impact, followed by the euro area. This is because China’s current growth rate is so much faster than those of the other majors.

- The results of our study suggest that Singapore, Hong Kong, Taiwan and Malaysia will be the most negatively affected in 2016, based on our growth forecasts for the major economies. We expect slower growth in the US and China to outweigh better growth from the euro area and Japan.

Economic linkages around the world are evolving rapidly, even during the current period of relatively sluggish global growth. For East Asia, the world’s most open region to trade, the question of who dominates global growth – and therefore demand – is critical. Back in 2000, the answer to this question was clear: the US, and particularly the US consumer. As Figure 4 shows, the US economy contributed 1.27ppt of the global growth rate of 4.8% in 2000, even as it expanded just 4.1%. China, whose economy expanded 8.4%, contributed only 0.34ppt.

By 2014, the US’ contribution to global growth had fallen to just 0.54ppt of 3.4%. China’s contribution rose to 1.00ppt, even as its growth rate slowed to 7.4%. This demonstrates the importance of an economy’s scale as well as its growth rate in

We examine how the relative importance of the major economies on Asia has evolved over the years

Figure 2: The US and EU are by far the biggest consumers
Nominal consumer spending USD bn

Source: CEIC, Standard Chartered Research

Figure 3: But China is incrementally consuming more than the US or EU (change in consumer spending, USD bn)

Source: CEIC, Standard Chartered Research
determining its influence on global growth. China has the most powerful combination of size and pace in influencing Asia’s growth.

Even though the level of US GDP (using market exchange rates) is still well above China’s, China easily surpasses both the US and the euro area in terms of the USD-equivalent increase in its consumer spending (see Figures 2 and 3). The centre of gravity has clearly shifted east. At the same time, the economies in our sample are becoming a key source of global demand and growth in their own right (Figure 4); we explored this theme in detail in Special Report, 5 November 2014, ‘ASEAN growth in the fast lane’.

Identifying the source of final demand

Traditional trade data clearly shows the rapid rise in China’s share of total trade for the economies in our study (Figure 5 in ‘Where does final demand lie?’ section). However, given the evolution of supply chains since the start of the 2000s, it is increasingly difficult to determine the ultimate source of demand for goods exported from these countries. In particular, China imports intermediate goods from other Asian economies that are finished in China and then sent on to their final destinations. Export data reported at the country level does not tell us the final destination of a country’s exports. Data from the OECD provides a better indication of the ultimate sources of demand for the region’s goods (this data series includes services exports, whereas direct trade data reported at the country level does not).

Based on this, we find that China is the most important source of final demand for our sample of economies as a whole, although to a lesser extent than direct exports suggest. For seven of the economies in our study – Australia, Hong Kong, Malaysia, Singapore, South Korea, Taiwan and Thailand – the shares of their exports for end use in China are lower than official direct export data indicates.

Importantly, data on final export destinations also reveals that for six of the 10 economies in our study, the share of exports accounted for by the four major economies is lower than the traditional direction of exports data suggests: Hong Kong, Malaysia, Singapore, South Korea, Taiwan and Thailand. We think this shows that the rest of the world, particularly Asia, is playing an increasingly important role in global growth. We expect this trend of rising intra-regional trade to be a dominant force in the coming years.

Figure 4: China, India and ASEAN to dominate world growth

Pct contributions to global GDP growth

<table>
<thead>
<tr>
<th>Year</th>
<th>US</th>
<th>Euro area</th>
<th>JP</th>
<th>CN</th>
<th>AXCJ</th>
<th>Latam</th>
<th>MENA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000 (4.8%)</td>
<td>1.27</td>
<td>0.75</td>
<td>0.34</td>
<td>0.38</td>
<td>0.25</td>
<td>0.15</td>
<td></td>
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<tr>
<td>2014 (3.4%)</td>
<td>0.54</td>
<td>0.41</td>
<td>0.15</td>
<td>0.12</td>
<td>0.10</td>
<td>0.22</td>
<td>0.03</td>
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<tr>
<td>2020f (4.0%)</td>
<td>0.59</td>
<td>0.21</td>
<td>0.19</td>
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Source: IMF, Standard Chartered Research, IMF data
Changing trade patterns are one source of changes in growth transmission. However, other linkages, both direct and indirect, also matter to growth transmission. For example, the slowdown in China’s growth has affected commodity prices, and this has had an indirect impact on commodity producers (even if they are not selling to China).

We ran two empirical tests to gauge the growth impact of the major economies on Asia. First, we ran a series of rolling regressions to indicate changes in the sensitivity of GDP growth in our sample economies to growth in each of the four major economies (i.e., the beta). Second, we used vector auto regression (VAR) and impulse response analysis to gauge the likely impact of a 1ppt shock to y/y GDP growth in each of the four major economies.

How have relationships evolved?
The rolling regressions provide a dynamic view of growth relationships. The result is in line with changing trade patterns – China has grown in importance to Asia, surpassing the US in the last few years. With our rolling regression tests, we also tested how much consumption or investment in the US and China mattered to Asia. We found that consumption is more important than investment in both cases. US consumption is still a bigger driver than consumption in China, but our results suggest the growing influence of the Chinese consumer. Interestingly, investment in both the US and China showed a limited empirical relationship with Asia’s growth.

While rolling regressions are a powerful tool to estimate the evolution of a relationship, they are based on ordinary least squares (OLS) regressions, which suffer from a number of limitations in the real world. The multicollinearity problem becomes dominant – this is where two or more explanatory variables are highly correlated with each other, undermining models with more than two variables. This limited us to looking at only the top two final export destinations for each country, as adding more variables undermined the results. Overall, we find that China’s beta – the impact on each economy for every ppt change in its growth – has increased across the board, particularly since 2011.

Figure 5: China’s importance has risen in more recent years
Sensitivity to a 1ppt change in GDP growth

Note: Rolling regression with 20-quarter window; beta shows impact on GDP growth from a 1ppt change in China and US growth; size of bubble represents size of the country’s GDP; Source: Standard Chartered Research
Overview

A US growth shock has the highest impact on Asia

Second, we used vector auto regression (VAR) and impulse response analysis to provide insights into the likely impact of a 1ppt shock to y/y GDP growth in each of the four major economies. We found that during the sample period from 2000-15, the US would cause the largest shock to eight of our 10 Asian economies in this scenario, followed closely by the euro area and China. By this measure, China is less dominant than trade links suggest. This may be because our impulse response analysis (which used the generalised impulse response approach) allows for feedback between the major economies. This may increase the influence of the US given its impact on the other major economies. The same goes for the euro area.

In a hypothetical scenario where growth rates fell by half in the four major economies, China’s slowdown would have the biggest impact. This reflects China’s much faster growth rate than those of the other three major economies.

We also conducted a shock analysis using a shorter timeframe from 2005-15. Here, we found that a shock in China would have a larger impact than during the longer timeframe. This is in line with our rolling regression findings, which indicate China’s growing influence. However, the US and euro area are still very important in the shorter timeframe, underlining the large size of their economies.

On a GDP-weighted basis across our sample countries, we found that a 1ppt y/y negative growth shock in the majors would result in a 1ppt fall in growth. Based on our 2015 and 2016 GDP growth forecasts – US growth slowing to 1.6% from 2.4%, the euro area accelerating to 2.5% from 2.1%, Japan accelerating to 1.2% from 0.8%, and China slowing to 6.8% from 6.9% – the overall impact on Asia’s growth is negligible in 2016. Our 2016 growth forecasts for the majors indicate that Singapore, Taiwan, Hong Kong and Malaysia will be the most negatively affected.

Figure 6: Impact on Asia from a 1ppt change in y/y growth (2000-15 sample period)

US, China, euro area and Japan’s impact on GDP levels, ppt

Source: Standard Chartered Research

12 November 2015
Where does final demand lie?
**Linked by trade**

**Final demand versus immediate demand**

Trade exposure is one of the best means of growth transmission between countries, in our view. Asian economies are relatively open, meaning trade is a more important growth driver than in other regions. Of the 10 economies we analysed, five have trade-to-GDP ratios above 100%: Singapore, Hong Kong, Taiwan, Malaysia and Thailand. Korea’s is slightly below 100%. The less open economies in our sample are the Philippines, India, Indonesia and Australia.

Measuring direct exports and imports is the most straightforward way to gauge trade dependence between two countries. The direct trade relationship is important for both economies, as it feeds through to other parts of the economy, including logistics, financial services and supply chains.

But focusing only on direct trade misses an important point – where the end demand is actually coming from. Knowing where a country’s exports are ultimately bound allows us to answer the question of which economy matters most for growth in the region.

To do this, we use data from the OECD-WTO database. We focus on the ‘origin of value added in final demand’ of the four major economies using the source country datasets. This indicates where exports from our sample countries ultimately go – for example, how much final demand from China contributes to Singapore’s GDP via value-added exports from Singapore to China. Services exports are included in this data series but not in direct export data. The latest data available (updated as of October 2015) is only to 2011, but we believe this is the best data source to measure final demand.

Figure 2 illustrate the importance of China, the US, the EU and Japan to Asian economies in terms of direct and indirect trade exposure.

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**Figure 1: Asia is a trading region**

*Trade in goods and services as a % of nominal GDP, 2014*

Source: CEIC, Standard Chartered Research
**Key findings – China leads, particularly on direct exports**

- China is the most important export market for our sample countries as a whole, measured in terms of both final demand and direct exports.

- Measured in terms of final demand, China’s dominance is not as high as the direct trade data suggests; this reflects the high proportion of intermediate goods that are exported to China from our sample countries and ultimately sold to other markets.

- Even so, all 10 countries in our sample saw a rise in their exports ultimately bound for China between 1995 and 2011. This increase (in terms of contribution to their GDP from 1995 to 2011) ranged from 2x to 12x across our sample between 1995 and 2011.

- In terms of final demand, our sample countries exported 1.3x more (as a percentage of their GDP) to China than to the other three major economies in 2011. Looking at direct exports, the differential was greater, at 2.3x, in 2014.

- China is the most important direct export market for seven of the 10 countries in our study (in terms of percentage of the exporter’s nominal GDP). All 10 countries in our sample increased their direct exports to China during the 1995-2014 period, with increases ranging from 2x to 12x (coincidentally the same range as for final demand). Conversely, six of them saw a decline in exports to the three other major economies during the same period.

- We also measure total trade exposure (imports plus exports) between the countries. Here, China dominates as the key trade partner for the countries in our study.

**China dominates, albeit less than direct exports suggest**

China is the most important export market for our sample of countries as a whole, although this dominance is less apparent in terms of final demand than direct exports. The reason for this difference is that goods exported to China may be re-exported after value-addition, indicating that end demand lies somewhere else.

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**Figure 2: A meaningful portion of Asia’s exports to China ends up in other destinations**

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<th>% of total exports</th>
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<td>China</td>
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Note: Final demand exports represents the latest data from the OECD using ‘origin of value add – 2011’ data; Source: OECD, CEIC, Standard Chartered Research
Intermediate goods accounted for about 80% of China’s total imports in 2014. This compares with 54% for the US and 63% for the EU (see Figure 3). We normalise the OECD-WTO data on exports to final destination against the nominal GDP of each exporting country. This allows a comparison of the final demand impact from the four major economies on each of the Asian economies in our sample.

This data series shows that China, while still important, is less dominant than when measured via direct exports. Based on final demand, China’s imports from the 10 countries in our study were 1.3x higher than the average of those absorbed by the US, the euro area and Japan (as a percentage of the exporters’ GDP), according to data as of 2011. This difference rises to 2.3x when direct exports are measured. Using the final demand measure, the relative importance of China, the US, the EU and Japan is far more even than based on direct exports alone.

Measured by direct trade data (as opposed to final demand), China’s dominance is greater, particularly for Hong Kong, Singapore, Korea and Taiwan. To illustrate, Hong Kong’s direct exports to China accounted for 88% of its nominal GDP in 2014, but Hong Kong’s exports finally bound for China accounted for only about 11% of its 2011 GDP. For Singapore, the difference was 17% versus 6%. Figures 4 and 7 illustrate the relative importance of China, the US, the EU and Japan to Asian countries in terms of direct and indirect trade exposure.

Even so, China’s final demand is still the most important for five of the 10 Asian countries in our sample, measured as a percentage of their nominal 2011 GDP: Hong Kong (10.8%), Taiwan (9.3%), Malaysia (8.4%), Singapore (5.7%) and Korea (5.4%) – see Figure 4.

There are two important elements in assessing the importance of a destination country to an exporting country: (1) the total level of exports involved, and (2) the change in the level of exports, in terms of both direction and amount (returning to our mass x velocity argument).

When it comes to the changing importance of final export markets, China dominates. All 10 economies in our study recorded growth in exports ultimately bound for China during the 1995-2011 period (measured in terms of GDP contribution). Growth in this

**Figure 3: China imports a disproportionate amount of intermediate goods**

*Imports, USD bn*

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Source: COMTRADE, Standard Chartered Research

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HK’s direct exports to China accounted for 88% of HK’s GDP; but China only accounted for 11% of HK’s GDP if we look at HK as an origin of value-add to China’s final demand.
contribution ranged from 2x to 12x over the period. All 10 countries recorded declines in their exports ultimately bound for Japan. For the US and the EU, seven of the countries recorded declines in value-add to final demand between 1995 and 2011.

The US and EU are more important as sources of final demand than as direct export markets. For seven of our sample countries, the US’ contribution is larger in terms of final demand than direct exports. However, the US was not the highest exposure in terms of direct exports for any of the 10 Asian economies in 2014. In 1995, it was the highest for six of the 10 economies.

Six of the Asian countries in our sample saw their direct exports to the US, the EU and Japan (as a percentage of GDP) decline between 1995 and 2014. Those from Malaysia, the Philippines and Singapore more than halved during the period, while Thailand’s increased slightly.

The economies in our sample rank as follows in terms of their direct exports to China as a percentage of 2014 GDP: Hong Kong (88%), Singapore (17%), Taiwan (16%), Korea (10%), Malaysia (9%), Thailand (7%) and Australia (6%). Japan accounts for the highest share of direct exports for only two of the 10 countries, the Philippines (5%) and Indonesia (3%). The EU has the highest share for only one country, India’s (3%).

Figure 4: What are the final destinations of Asia’s exports?
% of nominal GDP

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<tr>
<th>Country</th>
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<tbody>
<tr>
<td>CN</td>
<td>0.4</td>
<td>2.8</td>
<td>1.2</td>
<td>0.3</td>
<td>3.6</td>
<td>1.3</td>
<td>12.3</td>
<td>5.7</td>
<td>0.6</td>
<td>5.2</td>
</tr>
<tr>
<td>US</td>
<td>2.4</td>
<td>2.5</td>
<td>9.2</td>
<td>5.5</td>
<td>3.8</td>
<td>2.9</td>
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<td>9.1</td>
<td>6.1</td>
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<td>3.8</td>
<td>2.4</td>
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<td>3.4</td>
<td>1.0</td>
<td>0.6</td>
<td>4.2</td>
<td>3.1</td>
</tr>
</tbody>
</table>

Source: OECD, Standard Chartered Research
Figure 5: China is the top trading partner for Asia
Total merchandise trade as % of nominal GDP; 2014

Source: CEIC, Standard Chartered Research

Figure 6: US has largely ceded its role as Asia’s top trading partner to China
Total merchandise trade as % of nominal GDP; 2000 (2003 for IN, 2006 for PH and 2012 for ID)

Source: CEIC, Standard Chartered Research

Figure 7: Direction of trade underlines China’s position as the factory of the world
% of GDP (Taiwan uses 2000 data instead of 1995)

Source: OECD, Standard Chartered Research
Tourism also transmits growth

Tourism is another good channel of growth transmission. Tourism encompasses both business and leisure travel, and the movement of people increases connectivity between economies. Tourism makes up a significant share of GDP for EM Asia; in Thailand, for example, it is almost 9% of GDP.

The rise of the Chinese tourist in Asia has been impressive. Chinese tourists generally account for a larger portion of tourists in Asia than any other nationality, easily exceeding their counterparts from the US, Europe and Japan in most countries. Europe accounts for the second-largest share of tourists for most countries, ahead of the US and Japan. While China’s geographical proximity helps, the rising affluence of its middle class is the key driver of this growth. This is in line with the country’s rising domestic consumption.

Even for the Philippines, the only country where China does not figure in the top 2 shares of total tourists, Chinese tourist arrivals are growing faster than tourist arrivals from the other majors. In fact, China is the only majors whose share of tourists has increased for all Asian countries; the share of US tourists has fallen almost across the board.
Not only are more Chinese tourists travelling to destinations in Asia, they are also spending more. Per-capita spending by Chinese tourists is already similar to or higher than levels for US tourists in Australia and Singapore. In all of our sample countries, the total amount of tourist spending is significantly higher for Chinese than for US travellers due to the higher number of Chinese tourists.

**Foreign direct investment**

Foreign direct investment (FDI) is another crucial channel of growth transmission. The euro area is still the biggest investor in the 10-nation ASEAN bloc (the region for which FDI data is available). Japan is the second-largest investor in the region as it invests more in ASEAN-6 countries. Economic recoveries in Europe and Japan should be positive for Asia, prompting companies to invest more overseas.

FDI from China into the region is still quite low, at less than 10% of total FDI for most countries (the exception is Hong Kong, where China has made significant investment). This is likely to change as China seeks to engage more closely with the region, including via investment. The US is the only one of the four major economies whose FDI in ASEAN dropped from 2010 to 2013.

The China-led 'One Belt One Road' (OBOR) infrastructure initiative, which aims to link China to the rest of Asia and beyond, is likely to boost China’s investment in the region. OBOR consists of a network of overland roads and rail routes, oil and natural gas pipelines, and other infrastructure projects; we estimate that official financing could top USD 1tn in the next decade. The recent establishment of the Asian Infrastructure Investment Bank (AIIB) and New Development Bank (NDB), in which China is the biggest shareholder, should also boost Chinese investment in the region.

The property market is another investment channel through which China and other major economies can affect Asian growth. Singapore’s property market, for example, has rallied in the past few years, rising 49% from June 2009 to September 2015—fuelled in part by rising Chinese investment. Buyers from China accounted for 7.2% of foreign buyers in 2013, up from 3.7% in 2009.

![Figure 12: EU and Japan are big investors in ASEAN](image1)

![Figure 13: Pace of FDI to ASEAN has risen, except from the US (USD bn)](image2)
Changing growth influences –
An empirical study
The evolving impact of majors on Asia

Rolling regressions show China's rising influence

We examine how relationships between the Asian economies in our study and the major economies have evolved over the past decade. We start by using rolling regressions to assess the direction and stability of the relationships over time. We find that the sensitivity to China’s growth is rising.

The betas from our rolling regressions represent the impact on domestic GDP growth from a 1ppt change in GDP growth in each of the four major economies. A higher beta implies a larger impact on local economic growth for the same change in GDP growth in each of the majors. Based on betas alone, we find that sensitivity to China has risen to the top for Korea, Hong Kong, Taiwan, Singapore and India, particularly since 2011. The US is the bigger beta for Australia, Indonesia and Malaysia. Japan weighs in as the most significant for Thailand.

However, China’s importance to Asian economies is even higher than that conveyed by the simple magnitude of its beta, because its economy is growing more than three times faster than the US (and even faster than the other major economies). To determine the actual impact of a major economy on GDP growth in our sample economies, we multiply its beta by its real GDP growth. So assuming equal betas, China’s impact would be about three times greater than that of the US. Taking Singapore as an example, China’s beta is 2.69 and that of the US is 1.01 for the most recent period; factoring in their growth rates, their contributions to Singapore’s GDP growth are 18.8 for China and 2.7 for the US.

Key findings – China’s influence is increasing

- The significance of China’s growth for Asian economies, as indicated by the betas, has increased since the global financial crisis. Most of our results show that China’s beta increased rapidly in the period from 2010-13 (as indicated by the shaded region in Figures 1-7).

- The importance of China’s growth is amplified when we account for the fact that its growth rate is more than three times higher than that of the US. Figures 3 and 4 illustrate the difference between the betas and the actual contribution of the majors to growth, using Singapore as an example.

- The betas for all four of the majors have declined in the past few quarters for all of the countries in our study. This implies that growth in Asian economies is increasingly reliant on domestic demand.

- We found strong relationships between domestic consumption in China and the US on the one hand and Asian exports on the other. While the relationships were not as strong as for GDP, the results show that China’s domestic consumer demand is also increasing in significance.

- Surprisingly, we found that investment in US and China does not have a significant relationship with Asian exports, even for countries dependent on commodity exports. This may be due to data issues.
Rolling regressions – Top charts

Figure 1: The US was empirically more important before... Q1-2005 to Q4-2011, avg. quarterly y/y GDP growth

![Graph showing US and China beta over time](image1)

Note: Rolling regression with 20-quarter window; beta shows impact on GDP growth from 1ppt change in China and US growth; Source: Standard Chartered Research

Figure 2: ... but China has overtaken it recently Q1-2012 to Q2-2015, avg. quarterly y/y GDP growth

![Graph showing US and China beta over time](image2)

Note: Rolling regression with 20-quarter window; beta shows impact on GDP growth from 1ppt change in China and US growth; Source: Standard Chartered Research

Figure 3: For Singapore, China beta has risen above US... China and US beta, for Singapore's growth

![Graph showing US and China beta over time](image3)

Note: Rolling regression with 20-quarter window; beta shows impact on GDP growth from 1ppt change in China and US growth; Source: Standard Chartered Research

Figure 4: ... and its growth significance is much higher China and US ppt contribution to growth, for Singapore

![Graph showing US and China contribution to growth](image4)

Note: Rolling regression with 20-quarter window; beta shows impact on GDP growth from 1ppt change in China and US growth; Source: Standard Chartered Research

Figure 5: US consumption is a strong driver for Asia China, US consumption on Singapore exports

![Graph showing US and China consumption impact](image5)

Note: Rolling regression with 36-month window; beta shows impact on export growth from 1ppt change in China and US consumption; Source: Standard Chartered Research

Figure 6: China’s consumption is a growing driver China, US consumption on South Korea exports

![Graph showing US and China consumption impact](image6)

Note: Rolling regression with 36-month window; beta shows impact on export growth from 1ppt change in China and US consumption; Source: Standard Chartered Research
China is empirically most important for Asia

The significance of China's growth has increased for all Asian economies in the years since the global financial crisis. Most of our results show that China's beta increased significantly in the 2010-13 period. This coincides with the period when China overtook Japan as the world's second-biggest economy and China's contribution to global growth overtook that of the US. China’s impact on the region increased under its CNY 4tn policy stimulus programme announced in November 2008, which fuelled strong credit growth until as late as 2011 and boosted infrastructure spending. Meanwhile, US growth was consistently disappointing during the period, with the Fed resorting to successive rounds of quantitative easing.

Our rolling regression analysis of all Asian economies found, as expected, that the trade-open economies in our sample have stronger, more statistically significant relationships with the major economies than the more closed economies. Economies where trade is close to or above 100% of GDP are more influenced by the majors, driven by stronger trade relationships; in closed economies, domestic consumption and investment are bigger drivers. Singapore, Hong Kong, Taiwan and South Korea show a stronger relationship with the majors than India, Indonesia, Australia and the Philippines, as we expected from 2001-2015. Notable exceptions among the more open economies were Malaysia and Thailand, which did not show significant relationships.

Singapore and Hong Kong are highly exposed to all four major economies. They are Asia’s most open economies to trade, with trade/GDP exceeding 300% for both. Hong Kong’s highest exposures are to China, the US and Japan, in that order; Singapore’s are to the US, China and the euro area.

Having established that growth in China and the US has the strongest impact on economies in Asia, particularly for those dependent on trade, we looked at the relationship between consumption growth in the US and China with Asia’s exports. We found strong relationships, albeit weaker than for GDP growth. This indicates the growing significance of China’s domestic consumer demand, in line with the authorities’ push to shift China’s growth model away from manufacturing and investment.

As China’s consumption outpaces that in Western economies, China’s importance to other Asian economies will continue to rise. While China is already the largest export market for the rest of Asia, a large share of these exports still reflects final demand from other countries. As China’s consumption increases, its role as a source of final demand for goods from Asia will also grow.

While consumption in China has gained importance in recent years, China’s growth during the global financial crisis was fuelled by strong infrastructure investment. Running a rolling regression analysis between investment in major economies and exports from our sample of Asian economies, we expected to see strong relationships between China’s investment and commodity exporters like Australia, Indonesia and Malaysia. Surprisingly, we did not find such relationships, apart from a mild one between Indonesia and China. We see two reasons for this:

1. Commodities are usually stocked in advance of anticipated demand spikes. Hence, unlike with consumption, there is likely a lagged relationship between investment and commodity imports.
2. The drop in commodity prices from the highs of 2013-14 has meant that while commodity export volumes have remained strong, export values have declined. In particular, prices of crude oil, iron ore and coal, China’s key commodity imports, have declined almost 60% from Q1-2014.
Rolling betas – GDP vs. majors

Figure 7: Betas of GDP of majors versus Asian economies’ GDP

Dashed lines are periods when the result is not significant

Note: Rolling regression with 20-quarter window; beta shows impact on GDP growth from 1ppt change in China and US growth; Source: Standard Chartered Research
Rolling betas – US, China consumption, investment vs. Asia exports

Figure 8: Rolling betas – US, China consumption, investment vs. Asia exports

Dotted lines are periods when the result is not significant (consumption impact on India, South Korea, Hong Kong and Philippines; investment impact on Australia and Thailand)

Note: Rolling regression with 36-month window; beta shows impact on export growth from 1ppt change in China and US consumption; Source: Standard Chartered Research
Estimating the impact of a growth shock
Shocking the major economies
US, euro area and China are all important

Our rolling regression analysis, presented in the previous section, gauged the relative economic influence of the major economies on the region, and showed China’s rising influence. In this section, we use impulse response tests to estimate the specific impact on Asian economies of an economic shock from the US, euro area, China and Japan. This more sophisticated technique allows us to assess the relative importance of all four economies in one model, which we could not do with the rolling betas. (See the appendix for a technical explanation of these techniques.)


Key findings – The US cannot be ignored

A key conclusion is that in both sample periods, when we apply the shock of a 1ppt y/y fall in each major economy’s growth rate, the US has the greatest impact, followed by euro area and China (see Figures 1 and 2). Japan is the least significant.

This runs somewhat contrary to our earlier finding that appears to indicate the growing dominance of China’s impact on Asia. However, our impulse response analysis allows for growth feedback between the major economies. For example, a shock in China will affect the US, which in turn will affect China. This means that the growth effects of each of the major economies will be more evenly distributed.

The difference in shock results between the 2000-15 and 2005-15 timeframes is slight. The key difference is that China’s impact increases relative to that of the other major economies. This is in line with our rolling regression result, which shows China's stronger influence in recent years.

Similar to our other conclusions, our impulse response tests show that the Asian economies’ exposure to China rises when China’s higher growth rate relative to the other major economies is taken into account. While the US economy is around 1.7 times the size of China’s at market prices, China’s growth rate is currently about three times higher than the US’. If we took the same impulse response results from our original 1ppt drop scenario and instead ran a scenario of each major economy halving its growth rate, then China would easily have the greatest overall impact (see Figure 3).

China also has the greatest impact in this analysis when we take into account its faster pace of growth

Figure 1: Impact on Asia from a 1ppt change in y/y growth (2000-15 sample period)
US, China, euro area and Japan’s impact on GDP levels, ppt

Figure 2: Impact on Asia from a 1ppt change in y/y growth (2005-15 sample period)
US, China, euro area and Japan’s impact on GDP levels, ppt

Source: Standard Chartered Research
China:
While our impulse response results show that a US growth shock would have the greatest impact on Asia’s growth, China’s importance increases in the more recent timeframe (2005-15).

US:
For the entire 2000-15 period, the impact of a 1ppt US growth shock has been larger for our sample Asian economies than that of a similar shock to the other major economies. The impulse response analysis allows feedback between the major economies and, given the size of US GDP, its impact on Asia is higher here than in our earlier analysis (such as the direction of trade). However, taking into account relative growth rates, China is the more dominant driver given its faster growth rate.

Euro area:
We find that the euro area, which has had a limited influence on the region in recent years due to its slow growth, can have as big an impact as the US or China in many cases. Euro-area GDP is almost 80% that of the US. Euro-area growth has been more volatile than US growth over the past five years, providing the (negative) swing impact in Asia. We found that euro area-growth has a strong impact on South Korea and Taiwan, and is also important for Singapore and Thailand.

Japan:
Japan has by far the lowest impact of the four major economies on growth in our sample economies. However, Japan’s growth has been more volatile than that of the three other three majors over the past five years; it has been almost twice as volatile as US growth. These swings in growth can have an still impact on Asian growth.

Large, closed Asian economies:
- Indonesia showed the least impact from the major economies; the impact on Australia was also low. The impulse response test did not provide a significant result for India, as India is a relatively large and closed economy.
- South Korea’s growth dynamics are surprisingly resilient to external shocks.

Figure 3: Impact on Asia from halving of growth rates (2000-15 sample period)
*Impact of US, China, euro area and Japan on GDP levels, ppt*

Source: Standard Chartered Research
Small, open Asian economies

- The trade-open economies in our sample (Singapore, Taiwan, Hong Kong, Thailand and Malaysia) are more impacted by growth in the majors than the more closed economies (India, the Philippines, Australia and Indonesia). For instance, a 1ppt growth slowdown in the US or China could cause Singapore’s GDP level to fall by a total of 1.65% or 1.63% over a year, respectively. This is more than Malaysia’s 0.53% or 0.26%, respectively.

- We find that a 1ppt y/y negative growth shock across all four majors would result in a 0.9ppt decline in growth in the economies in our sample on a GDP-weighted basis. Interestingly, if we shock each of the majors in isolation, the euro area provides the largest shock. To illustrate, to generate a 1ppt change in Asian GDP, a 3ppt shock to euro-area growth would be required; 9ppt to Japan; 4.3ppt to China and 3.8ppt to the US.

Based on our 2015 and 2016 GDP growth forecasts – US growth slowing to 1.6% from 2.4%, the euro area accelerating to 2.5% from 2.1%, Japan accelerating to 1.2% from 0.8%, and China slowing to 6.8% from 6.9% – the overall impact on Asia’s growth is negligible in 2016. Our 2016 growth forecasts for the majors indicate that Singapore, Taiwan, Hong Kong and Malaysia will be negatively affected the most.

The appendix (‘Our generalised VAR framework’) provides a more technical description of the model used.
Impulse response results

Figure 6: Impact on Asia of 1 ppt y/y shock to the majors
US, China, euro area and Japan’s impact on GDP levels, ppt

South Korea
More resilient compared to HK and Singapore

Hong Kong
Shock seems to have a more lasting impact than the rest

Taiwan
US and Europe matters more than China over 2001 to 2015

Indonesia
Less impacted, more domestically resilient

Malaysia
US and euro area more important during 2001-15 period

Philippines
More resilient than Malaysia but less resilient than Indonesia

Singapore
Vulnerable to US, China and euro-area shocks

Thailand
Impact from euro area seems to come faster than the US

Australia
More domestically resilient

India
Less significant result compared to the rest of Asia

Source: Standard Chartered Research
Appendix: Methodology
Our generalised VAR framework

We use an econometric approach to measure the effects of shifts in the major economies’ growth on the Asia economies we cover. We aim to quantify the extent to which changes in US, China euro area or Japan growth cause fluctuations in these markets. The econometric method is a vector auto-regressive (VAR) model in which external variables are ‘Granger causing’ the domestic variables of Asian economies. We obtain an estimate of the magnitude of the shock using impulse response functions.

We used a generalised VAR for our primary test (or multiplicative impact) of ‘who matters more’ (see below). This excluded any block-exogeneity restriction on the VARs, meaning that the four major economies and the 10 Asian economies in our sample are free to impact each other.

For each Asian economy, we use its seasonally adjusted q/q GDP growth as the only domestic variable. For external variables, we only use seasonally adjusted US, China, euro-area and Japan q/q GDP growth rates.

The time series is quarterly, and we work with quarterly percentage changes in the original indices. For the GDP series, we used seasonally adjusted data where already available from the source; otherwise, we seasonally adjust the series using census X-12 methodology. We used sample periods, from Q1-2000 to Q2-2015, and from Q1-2005 to Q2-2015. We opted for five lags, based on a set of information criteria and the analysis of the models’ residuals.

A typical impulse-response function expresses responses in units of standard deviations of the variables. In our results, we convert the responses back into the original units of our variables using the standard deviation of the variables in the same sample period. We convert all of our results into y/y growth impact.

In the ‘multiplicative impact’ approach, a shock to either the US or China has a second-round impact on other economies, which will feed back into US or China growth. For instance, if US growth halves, poor US demand also affects China’s and South Korea’s exports and GDP growth, slowing US growth further. This will have the further effect of slowing South Korea’s economy further.

Our model has limitations. It took into account only five economies (US, China, euro area, Japan and the individual Asia economy being tested), and it provides only a blunt measure of each country’s impact on the others. However, we found the results to be insightful as an objective indicator of the likely impact of the major economies on economies in our sample.

Figure 1: An illustration of our generalised VAR analysis

*Source: Standard Chartered Research*
Rolling beta – Construction and methodology

Rolling regression for a time series involves running multiple regressions with a specified window of observations each time. This enables us to view the changing relationship of the independent variables with the dependent variable over time. This method is especially useful when relationships are dynamic and change over time, as is the case here, and enables us to determine the period during which other statistical operations, such as vector auto-regressive (VAR) analysis, should be performed.

We performed rolling analyses of GDP growth in the Asian economies in our study against GDP growth in the US, China, the euro area and Japan from Q1-2000 to Q2-2015. We used a 20-period (five-year) window for the rolling analysis. Essentially, this translates into multiple regressions with four independent variables performed 39 times, over a five-year period, for each country. For the rolling regressions of domestic consumption in US and China against Asian exports, we use monthly domestic demand data and used a 36-period (three-year) window.

2-country models provided stronger results than 3- and 4-country

The inclusion of all four majors together as independent variables gave us results in which the betas were not consistently significant, or were highly volatile. Removing the majors with insignificant relationships and running the regressions again, using models with three and two independent countries provided stronger betas. This better relationship is likely due to the multi-collinearity of the GDP growth of major economies; reducing the number of independent variables increases their betas. The two-country models provided the best relationships.

Of the four majors included in this analysis, the strongest relationships for most countries in our study were with the US and China. In addition to US-China, we also performed regression analysis with other combinations. The trade-open economies in our sample, particularly Singapore and Hong Kong, showed strong relationships with multiple pairs of countries in addition to US-China, highlighting their strong links to all the major economies via trade. We determined the strength of the relationships based on the below parameters:

1. Long periods of strong significance. We determined significance of the relationship at a confidence of 87.5%.
2. Betas being positive during the significant periods.

Figure 2: Four country regressions were unsatisfactory

China, US, euro-area and Japan GDP on Taiwan

Note: Rolling regression with 20-quarter window; beta shows impact on GDP growth from 1ppt change in China and US growth; Source: Standard Chartered Research

Figure 3: But US and China alone were stronger

China, US GDP on Taiwan

Note: Rolling regression with 20-quarter window; beta shows impact on GDP growth from 1ppt change in China and US growth; Source: Standard Chartered Research
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