# 18-2 Global Imbalances and the Trade Slowdown

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## Abstract

From the mid-1990s until the financial crisis, global trade grew twice as fast as global income, far faster than in previous or subsequent periods. During this period of rapid trade growth, global current account imbalances also expanded rapidly. If excess savings in some countries financed more consumption and investment in other countries, then trade and trade imbalances would move together. Greater capital mobility thus may help to explain why trade surged in the period before 2007 and why it slowed more sharply in later years when demand stalled. Consistent with this explanation, the countries that contributed most to global trade growth during the period of rapid trade growth also experienced large imbalances. Constraining trade deficits to historical norms, this paper shows that trade growth would have been more moderate in the late 1990s and early 2000s and stronger in subsequent years. Going forward, assuming global imbalances remain relatively unconstrained, the relationship between trade growth and income growth will likely be less stable than before the 1990s.

## INTRODUCTION

The current global trade slowdown is unprecedented in recent history. Global trade volumes plummeted 13 percent in 2009, many times the 2 percent decline in real GDP growth experienced in the depths of the Great Recession. While the trade collapse shocked economists, the slowdown in trade growth since 2011 has been an even bigger surprise. Real trade grew more than twice as fast as real GDP from 1990 to 2007, and more than 1.5 times as fast even before 1990, but since 2011 trade has grown only slightly faster than GDP.

Researchers have explored a number of potential explanations for the recent change in the relationship between income growth and trade growth. Most research points to a decline in demand, especially for investment goods that weigh heavily in trade flows, as the main factor.

Overlooked in the debate is how greater capital mobility and widening global imbalances may have enhanced the effects of demand on trade in the 1990s and early 2000s. In the period when trade surged, global imbalances also ballooned. If the excess savings in some countries financed more consumption and investment in other countries, then trade and trade imbalances would logically move together. Put differently, the ability to borrow from abroad allowed deficit countries to import more than they would have if they had been constrained by their exports, thus stimulating trade growth.

Figure 1 shows global imbalances across 76 countries with data going back to 1982. Global imbalances are calculated as the sum of the absolute values of the countries' current account balances relative to the sum of their incomes. When savings and investment in the large countries are equal, global imbalances will be close to zero. When some countries, such as China, Japan, Korea, and the Gulf countries, expanded their surpluses, and others, like the United States and several Southern European countries, expanded their deficits, the measure of global imbalances grew.

The figure also shows the ratio of trade to GDP, measured as total imports to total GDP for the same group of countries. Since about 1995, as global imbalances surged, so too did trade growth. The correlation between the ratio of trade to GDP and the ratio of global imbalances to GDP since 1995 is 0.80; the correlation before 1995 was –0.61.

Figure 2 shows the relationship in growth rates. Again, the correlation expands over time. The correlation was zero prior to 1995 and is 0.66 after 1995.

Further evidence of the relationship between imbalances and trade is apparent when countries are split according to the magnitudes of their current account balances. For countries with current account balances exceeding 2.5 percent of GDP, the correlation between trade growth and growth in global imbalances since 1995 is 0.67, while for the group with more balanced trade it is 0.25. The high correlation is not just a US and China effect. Excluding China and the United States, the correlation between global imbalances and trade growth for large-imbalance countries is 0.55 and the correlation for balanced-trade countries remains 0.25.

## RELATIONSHIP BETWEEN IMBALANCES AND TRADE

There is no reason that growing imbalances must be associated with rapid trade growth, but there is a potential mechanical relationship if trade grows faster than GDP. This section shows that rapid trade growth, however, was not sufficient to explain widening trade balances in the late 1990s and 2000s.

Assume imports and exports both grow at a constant rate, higher than GDP growth. Starting from a position of unbalanced trade, imbalances as a share of income will expand over time as trade grows. However, in this case, global imbalances relative to global trade should remain constant. This is a conservative assumption in the sense that it implies that for deficit countries international borrowing expands faster than income as trade grows.

For example, assume exports and imports are growing twice as fast as GDP (as happened in the 1990s), but trade growth is constant across exports and imports, then we have:

(1) Global imbalances/GDP at time t + 1 = t + 1 $= \frac{\sum_i |(1+2x)*X_i - (1+2x)*M_i|}{\sum_i (1+x) GDP_i} = \frac{(1+2x)}{(1+x)} * \frac{\sum_i |X_i - M_i|}{\sum_i GDP_i}$

(2) Global imbalances/total trade at time t +1= t +1 $= \frac{\sum_i |(1+2x)*X_i - (1+2x)*M_i|}{\sum_i (1+2x)(X_i + M_i)} = \frac{\sum_i |X_i - M_i|}{\sum_i (X_i + M_i)}$

where $x$ denotes GDP growth and $i$ is the index for individual countries.

As trade grows faster than income, imbalances as a share of GDP increase, but imbalances as a share of total trade do not. In fact, over the period in question both increased (figure 3), indicating that the growth in imbalances was associated with relatively high import growth in the importer/deficit countries and relatively high export growth in the exporter/surplus countries.

## DECOMPOSING TRADE GROWTH

If trade imbalances boosted trade growth in the 1990s and 2000s, then exports from surplus countries and imports by deficit countries would be expected to drive a large share of global trade. In fact, this is exactly what happened.

Figure 4 divides countries into three groups, deficit countries (those with average deficit above 2.5 percent of GDP), surplus countries (those with average surplus above 2.5 percent of GDP), and countries with balanced trade. It shows each group's contribution to global real trade growth, during the rapid growth period and during the slowdown. The period of rapid trade growth is 1998–2008 (1998 is the first year because data on real trade growth for China begin in this year). As shown in the left panel, during the period of rapid trade growth, strong import growth in deficit countries and strong export growth in surplus countries were important contributors to trade growth. In the recent slowdown (2012–15), trade growth has been both lower and more balanced.

Figure 5 shows contributions by region. The rapid trade growth period was associated with rapid export growth in Asia and rapid import growth in the Americas. During the slowdown, trade in Europe also slowed markedly, but it was more balanced, linked to slowing growth associated with the euro crisis.

Figure 6 shows the contribution to trade growth by countries in East Asia and the United States, before and after the financial crisis. China recorded especially fast-growing exports and the United States recorded especially

fast-growing imports in the rapid growth period. Both moderated in the slowdown period, the gaps between export and import growth closed, and in the case of China reversed. Among other East Asian countries, Japan and Korea also experienced widening trade imbalances in the early period, which have disappeared or reversed since 2011.

## IMBALANCES AND TRADE GROWTH AT THE COUNTRY LEVEL

If imbalances are associated with more trade, this link should be apparent at the country level as well, at least for the large countries driving aggregate trade and imbalances. This section examines whether trade grew faster than GDP in periods when imbalances were expanding, within countries over time, controlling for global growth. In the basic regression, the dependent variable is the change in the ratio of trade to GDP and the independent variable is the change in the absolute value of imbalances to GDP. Year fixed effects are included in all regressions to pick up global trade growth.

One concern with this specification is that if exports and imports are growing at a constant rate, then trade imbalances could widen because of the mechanical relationship described in section 2. To account for this possibility, the growth in absolute balance relative to trade is, conservatively, used as an alternative independent variable.

$$\frac{Trade_{it}}{GDP_{it}} - \frac{Trade_{it-1}}{GDP_{it-1}} = \gamma_t + \beta \left[ \frac{AbsBalance_{it}}{Trade_{it}} - \frac{AbsBalance_{it-1}}{Trade_{it-1}} \right] + \varepsilon_{it}$$

The variable of interest, the growth in the absolute balance relative to trade, will increase only if imbalances expand faster than total trade. This regression tests whether periods when trade is growing faster than income are also periods when imbalances are growing faster than total trade. The year fixed effect, $\gamma_t$, controls for increasing openness over the period and global shocks.[1] The variable of interest is the increase in the level of imbalances to total trade. A positive coefficient on imbalances relative to trade would imply that periods of high trade growth are accompanied by relatively faster import growth in a deficit country and relatively faster export growth in a surplus country.

The results, reported in table 1, show that over the whole period there is a positive correlation between growth in relative imbalances and growth in openness (column 1). The results for the period before 1995 are not significantly different from the results after, suggesting that the higher correlation in the recent period in the aggregate data is due to larger swings, and not a different relationship between imbalances and trade. The final three columns consider large economies (with average GDP over the period greater than $200 billion), countries larger than Denmark. The idea is to see whether balances in systemic countries were more important in the second period. The results are robust for all countries and for large countries post-1995, irrespective of

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1. Results are almost identical if country fixed effects are included (not reported). Since the equation is in first differences, country effects control for constant growth in openness.

which specification is used, the more liberal one, comparing imbalances with income, or the conservative one, comparing imbalances with trade (column 6).

Overall, the results offer evidence that within countries, imbalances and trade have tended to move together, especially for large countries in the period of hyperglobalization. The results from the liberal method in the upper panel suggest that a one percentage point increase in the change in trade imbalances to GDP is associated with a 0.6 to 0.8 percentage point increase in the change in trade to GDP.

The magnitudes are economically meaningful. For the United States, the absolute balance relative to GDP increased by 4 percentage points and the absolute balance relative to trade increased by 13 percentage points between 1995 and 2007. The trade-to-GDP ratio increased by 5.5 percentage points. The liberal method in the upper panel suggests that for the United States, about half of the faster growth in trade compared with GDP was driven by widening imbalances (0.6 * 0.04 = 0.024). The conservative method in the lower panel also suggests that for the United States, about half of the faster growth in trade compared with GDP was driven by widening imbalances (0.19 * 0.13 = 0.025). In fact, the exports-to-GDP ratio for the United States rose by less than a percentage point over this period, so faster trade growth for the United States was almost entirely a result of rapidly growing imports, and hence the imbalance.

For China, the role of imbalances is less pronounced. The absolute balance relative to GDP increased by 7 percentage points and the absolute balance relative to trade increased by 9 percentage points between 1995 and 2007, implying that imbalances contributed to an expansion of openness in China of only 2 to 4 percentage points. For China, the trade-to-GDP ratio increased by 28 percentage points, mainly driven by the exports-to-GDP ratio, which increased by 18 percentage points. But, import growth was also vibrant: The imports-to-GDP ratio was up 10 percentage points.

## WHAT WOULD TRADE GROWTH HAVE LOOKED LIKE UNDER MORE BALANCED GLOBAL TRADE?

An alternative way of investigating the potential effect of global imbalances on trade growth is to assume exports constrain current account deficits. The focus is on import constraint in deficit countries because global imbalances after the financial crisis contracted almost entirely because of a reduction in demand in deficit countries (IMF 2014). In addition, widening deficits—not surpluses—are a systemic risk.

For this exercise, nominal data are used because current accounts are measured in current dollars. The year 2015 is excluded because nominal trade declined sharply that year owing to the 50 percent drop in oil prices.

Two series are created; one restricts countries to trade balance and the second allows countries to run deficits similar to historical norms. Specifically, under the latter case, for each deficit country, imports are assumed to be constrained to ensure that the trade deficit to GDP does not exceed

1. 2.5 percent of GDP and
2. the average value plus 2 standard deviations, during the period 1980–95.

The first criterion ensures that the deficit is reasonably large. The second ensures that it is larger than its historical norm. The second condition is important because a number of small developing countries had large imbalances in the 1990s, and the rule allows them to maintain these imbalances.

For countries where the deficit reaches the limit, imports are assumed to decline to the level that would allow the current account deficit to be within one standard deviation of its historical value or to trade balance, whichever is larger. This case maintains global imbalances near an average of 2.5 percent of GDP.

For both specifications, feedback effects to surplus countries are incorporated because exports use imports in their production. The feedback effect is based on the import content of exports in each year.[2] Specifically, for global trade to be balanced, exports above balance from surplus countries must decline by the same amount as the decline in excess imports by deficit countries. The export reduction is then translated to an import reduction in surplus countries, using the annual average import content of exports. No further feedback effects, from the decline in imports by surplus countries, are assumed.

Figure 7 shows observed exports and predicted exports assuming current account balances were restricted to be balanced or to prevent imbalances from exceeding historical norms. In both cases, the ramp up in trade would have been somewhat slower than was realized. In the case where trade deficits are constrained, but not limited to balanced trade, the 2012–14 growth slowdown is less dramatic because the 2010–11 rebound in trade happens more gradually than actually occurred.

Table 2 records average trade growth for the periods 1995–2008 and 2012–14, for observed flows and the series where current account balances were restricted. It also shows average trade growth relative to average income growth. The evidence is consistent with growing imbalances contributing to more rapid trade growth during the first period and moderating trade imbalances contributing to slower growth in recent years. Overall, about 20 to 50 percent of the drop in trade growth relative to GDP growth can be explained by the rise and fall in imbalances.

## Transmission of US Shock to East Asian Economies

The previous section assumed that the large deficit countries drove trade growth. How feasible is this? The United States was the most important deficit country. To the extent that the period of rapid trade growth was driven by US demand fueling export growth in Asia, trade in the Asian economies will tend to move with US total imports. This section explores whether US imports are positively correlated with total exports and imports of East Asian surplus countries.

Table 3 shows results from regressing real import and export growth in the East Asian countries on real US import growth. East Asian imports may also be correlated with US imports, because a high share of the imports are inputs used in exports. For example, in Japan the import share of exports is 20 percent, in China it is 30 percent, and in Korea it is 40 percent.

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2. Data on exports, imports, GDP, and the import share of exports are available for 57 countries obtained from the from the OECD Trade in Value Added (TiVA) database.

Table 3 shows that, for surplus Asian countries, both import growth and export growth are highly correlated with US import growth. In contrast, for the East Asian countries with roughly balanced trade or trade deficits, the correlations are much lower and not significant. While the surplus economies and the United States could be responding to global growth or other excluded variables, the fact that only the surplus countries show a strong correlation with US import growth is consistent with movements in imbalances enhancing the transmission from slow US growth to East Asian exports and imports.

## Is This Explanation Consistent with the Existing Literature?

The main explanations put forward for the recent trade slowdown are: (1) weak demand, especially for investment goods that are a big part of trade flows, (2) a slowdown in the development of global supply chains, and (3) protectionism.

The IMF *World Economic Outlook* (2016) did the most extensive study to date and found that demand is largely to blame for the trade slowdown, accounting for 50 to 80 percent, with supply chains and protectionism each explaining at most 5 percent. Their results are consistent with research showing that investment tends to drive trade movements (Bussiere et al. 2013). While trade imbalances are, of course, related to demand, neither study considered whether increasing global imbalances in the mid-1990s may have affected the relationship between trade and growth.

A number of studies focus on the role of China in the trade slowdown. Constantinescu, Mattoo, and Ruta (2015) find that the deceleration in vertical integration, particularly in China, is important. Gaulier et al. (2015) focus on China's rise as a manufacturing center and its shift to domestic demand as important in explaining changes in global trade growth over time. Considering the role of widening global imbalances in fueling trade growth is complementary to these studies in that it helps to explain how China's exports could grow so rapidly and the timing of the shift to domestic demand-driven growth.

The importance of borrowing in the period of hyperglobalization before the financial crisis is also consistent with work by Shin (2011) and Borio, James, and Shin (2014) on the surge in credit in the period leading up to the financial crisis. A banking glut led to an expansion of gross and net capital flows in the United States. On the real side, that was reflected in an import surge in the United States and the credit expansion also fueled greater unbundling of production.

While there is no reason trade could not surge in an environment of more balanced trade (indeed, most trade models assume trade is balanced), the ability to have large trade imbalances could enhance trade growth because countries can import more when demand is strong. The growth in cross-border capital flows magnifies the effects of the existing explanations because budget constraints are no longer binding. In terms of demand as an explanation, the ease of borrowing from abroad means that demand can exceed supply for longer periods, without price increases. Similarly, in the presence of greater capital mobility, the buildup of supply chains was likely faster than it otherwise would have been.

The trade growth puzzle may therefore be the next of kin to one of the major paradoxes in macroeconomics from the 1980s, the high correlation between savings and investment across countries. Theory predicts that savings should flow to the best investment opportunities. Because the top investment prospects may not be in the domestic market, the correlation between savings and investment across countries should be low. Instead economists found it to be very high in the 1960s and 1970s. This paradox, known as the Feldstein-Horioka puzzle (Feldstein and Horioka 1980) for the economists who uncovered it, has unraveled in recent decades, as the cross-country correlation between savings and investment declined. The widening and then narrowing of global imbalances that resulted from greater capital mobility contributed to more volatile trade growth. If instead the gap between savings and investment had remained limited, trade growth would have very likely been more balanced over time as shown in figure 7.

## IMPLICATIONS FOR TRADE AND GROWTH

The unprecedented trade growth that followed the rise of cross-border capital flows is linked to widening trade imbalances. Similarly, the recent period of slow trade growth is associated with a narrowing of global imbalances. From this perspective, the dramatic trade slowdown stems not just from weak global growth but also from weaker growth combined with a return to more balanced capital flows.

Going forward, even as global growth picks up, the new weaker relationship between trade and income may remain in place if global imbalances remain constrained. Overall, the dismantling of the Feldstein-Horioka puzzle may have ushered in a period when the relationship between global trade growth and global income growth is more volatile. In periods when demand is strong in large countries, their widening imbalances fuel trade growth to a greater extent than if they were constrained by their exports. Similarly, the eventual pressure to narrow trade deficits could eventually result in slower trade growth.

An alternative way of viewing the results is that the export-led growth policies in Asia, especially China, fueled strong trade growth in the late 1990s and early 2000s and widening imbalances. Those policies effectively shifted export growth from the future to that period, resulting in slower trade growth in recent years as pressure for more balanced trade increased. An important implication for the East Asian surplus countries is that they will now need to rely more on domestic reform and less on export-led growth. Over time, a new wave of global income and trade growth could result if the roles reversed and surplus East Asia absorbed a higher share of global capital flows.

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**Figure 1   Global imbalances and global trade since 1982**
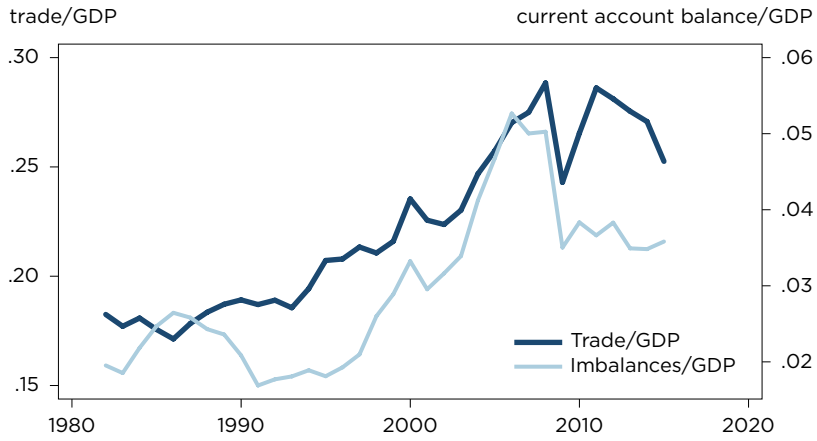


Note: Data are for a balanced sample of 76 countries, taken in US dollars.
*Sources:* World Bank, *World Development Indicators*; author's calculations.

**Figure 2   Growth in ratios of trade/GDP and imbalances/GDP**
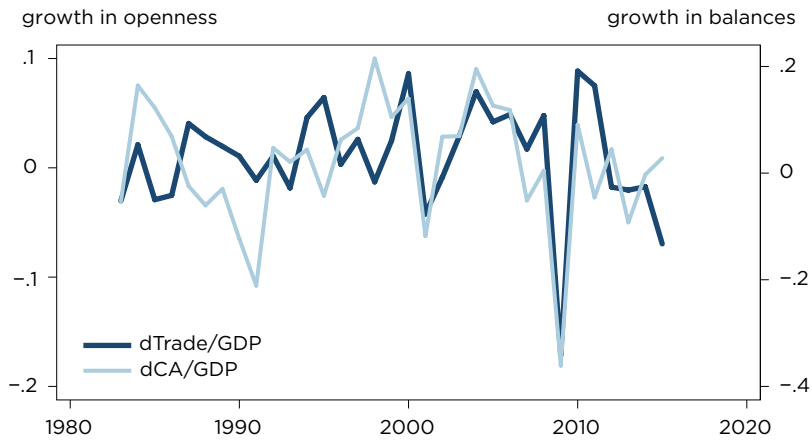


Note: Data are for a balanced sample of 76 countries, taken in US dollars.
*Sources:* World Bank, *World Development Indicators*; author's calculations.

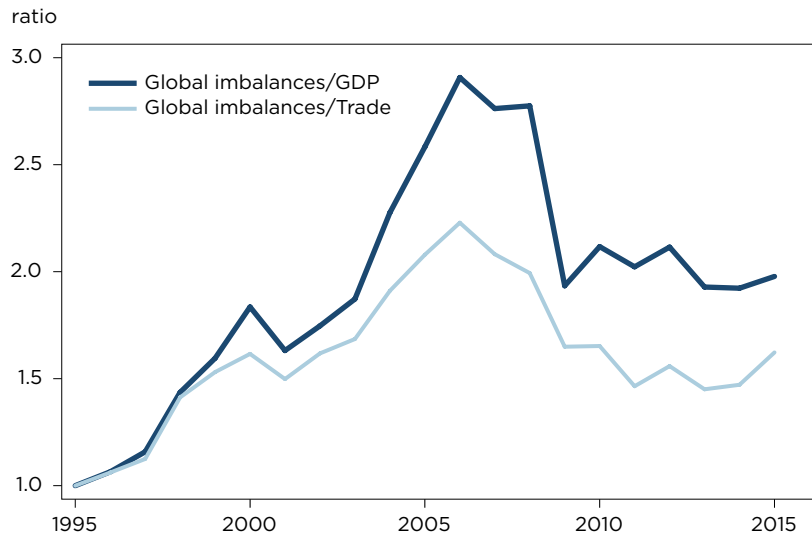**Figure 3  Global imbalances/GDP versus global imbalances/trade**

ratio



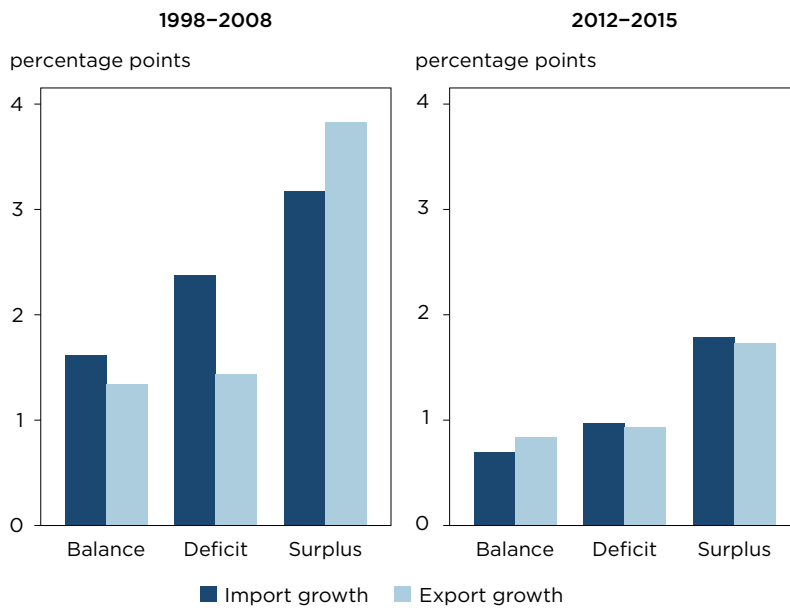Note: Data are for a balanced sample of 76 countries, taken in US dollars.
*Sources:* World Bank, *World Development Indicators*; author's calculations.

**Figure 4  Contribution to real trade growth, by type, before and after the financial crisis**

**1998−2008**

percentage points

**2012−2015**

percentage points



■ Import growth   ■ Export growth

*Sources:* International Monetary Fund; author's calculations.

**Figure 5   Contribution to global real trade growth by region and period**

1998–2008

percentage points

2012–2015

percentage points



■ Import growth   ■ Export growth
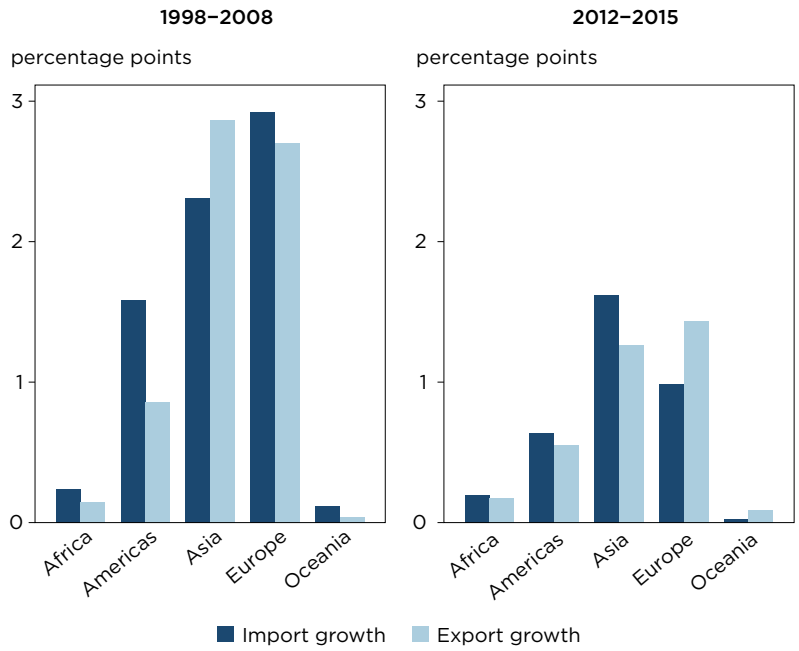
*Sources:* International Monetary Fund; author's calculations.

**Figure 6   Contribution to global real trade growth, by country and period**

### a. United States and China

**1998–2008**

percentage points



**2012–2015**

percentage points



### b. East Asia

**1998–2008**

percentage points



**2012–2015**

percentage points



■ Import growth   ■ Export growth
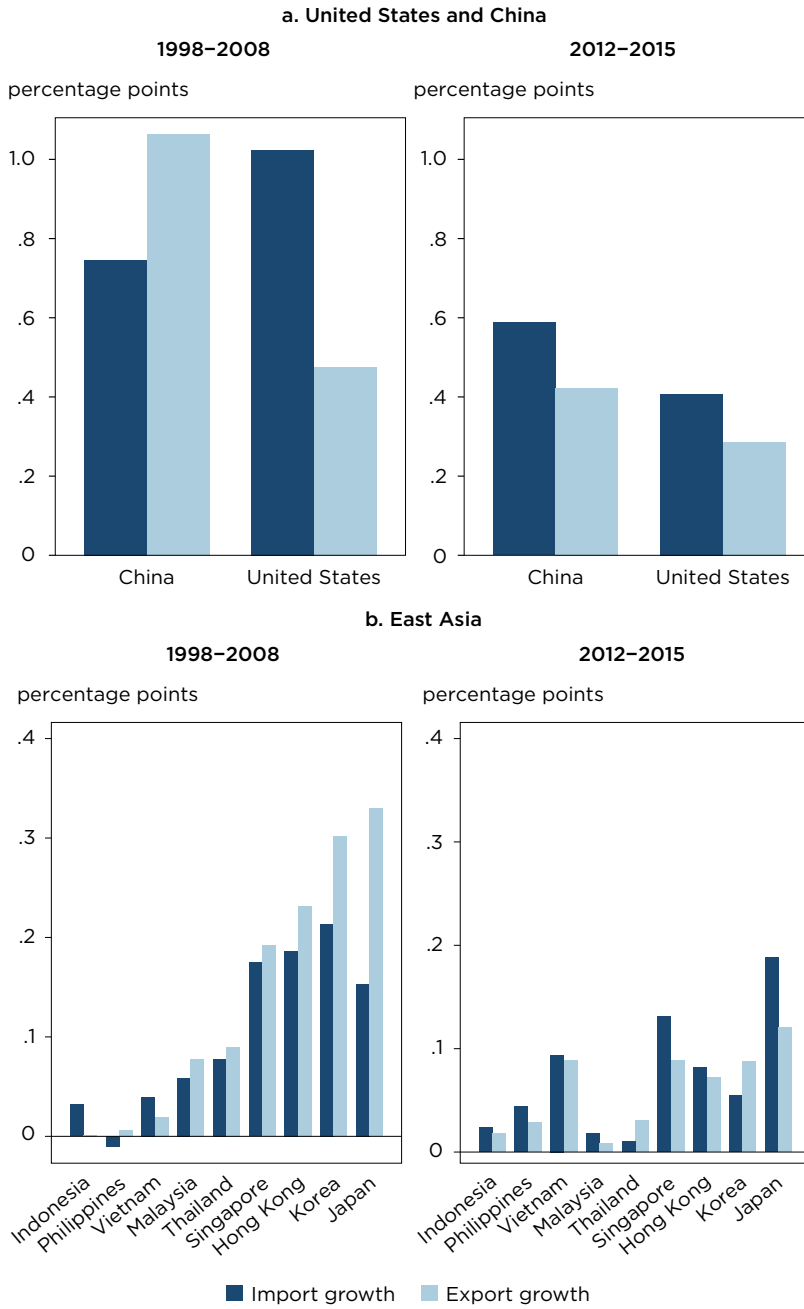
*Sources:* International Monetary Fund; author's calculations.

**Table 1   Panel regressions on trade and absolute balance**

| Variable | All (1) | Pre-1995 (2) | Post-1995 (3) | Large (4) | Pre-1995 large (5) | Post-1995 large (6) |
|---|---|---|---|---|---|---|
| | *Dependent variable: d(trade/GDP)* | | | | | |
| d(absolute value of imbalance/GDP) | 0.756*** (0.0550) | 0.813*** (0.0654) | 0.730*** (0.0765) | 0.669*** (0.245) | 0.829 (0.553) | 0.560*** (0.163) |
| Observations | 5,870 | 2,013 | 3,857 | 922 | 356 | 566 |
| R-squared | 0.317 | 0.281 | 0.337 | 0.270 | 0.175 | 0.356 |
| | | | | | | |
| d(absolute value of imbalance/trade) | 0.123* (0.0641) | 0.155** (0.0654) | 0.1000 (0.0999) | 0.0916 (0.0608) | 0.0342 (0.0736) | 0.194** (0.0913) |
| Observations | 5,870 | 2,013 | 3,857 | 922 | 356 | 566 |
| R-squared | 0.065 | 0.034 | 0.082 | 0.203 | 0.082 | 0.316 |

Notes: All regressions include year fixed effects. Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

*Source:* Author's calculations.

**Figure 7  Trade/GDP ratio without growing imbalances**



trade/GDP ratio

*Sources:* International Monetary Fund; Organization for Economic Cooperation; author's calculations.

**Table 2   Responsiveness of trade to income and global imbalances**

| Period | Trade growth (percent) | | | Elasticity | | |
|---|---|---|---|---|---|---|
| | Actual | Balanced | Restricted | Actual | Balanced | Restricted |
| 1995–2008 | 8.5 | 8.1 | 8.1 | 1.60 | 1.53 | 1.53 |
| 2012–2014 | 2.2 | 2.3 | 2.7 | 0.98 | 1.03 | 1.21 |
| Share of decline explained by imbalances (percent) | | | | | 19 | 48 |

*Source:* Author's calculations.

**Table 3  Trade growth in surplus Asian countries is highly correlated with US import growth**

| | Deficit | | Balance | | | | | | | Surplus | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | Laos | Cambodia | Vietnam | Indonesia | Philippines | Japan | Korea | China | Thailand | Hong Kong | Taiwan | Malaysia | Singapore |
| *Dependent variable: Import growth* | | | | | | | | | | | | | |
| US import growth | 0.0223 (0.414) | 0.66 (0.489) | −0.186 (0.418) | 0.505 (0.523) | 0.0767 (0.375) | 0.636*** (0.174) | 0.695 (0.400) | 0.596* (0.282) | 1.110** (0.417) | 0.625** (0.234) | 1.237*** (0.206) | 1.173*** (0.323) | 0.825*** (0.269) |
| Observations | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 |
| R-squared | 0.00 | 0.10 | 0.01 | 0.06 | 0.00 | 0.46 | 0.16 | 0.22 | 0.31 | 0.31 | 0.69 | 0.45 | 0.37 |
| Average CA/GDP | −16.26 | −5.82 | −1.14 | 1.12 | 1.83 | 2.72 | 3.28 | 3.84 | 3.86 | 7.22 | 7.66 | 10.28 | 18.89 |
| *Dependent variable: Export growth* | | | | | | | | | | | | | |
| US import growth | 0.275 (0.343) | 0.783* (0.381) | −0.108 (0.238) | 0.133 (0.371) | 0.434 (0.464) | 1.189*** (0.241) | 0.718*** (0.177) | 1.051** (0.364) | 0.931*** (0.131) | 0.720*** (0.222) | 1.013*** (0.206) | 0.918*** (0.206) | 0.740*** (0.212) |
| Observations | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 |
| R-squared | 0.039 | 0.209 | 0.013 | 0.008 | 0.052 | 0.603 | 0.508 | 0.342 | 0.761 | 0.397 | 0.602 | 0.553 | 0.432 |
| Average CA/GDP | −16.26 | −5.82 | −1.14 | 1.12 | 1.83 | 2.72 | 3.28 | 3.84 | 3.86 | 7.22 | 7.66 | 10.28 | 18.89 |

Notes: * indicates significance at the 10 percent level, ** at the 5 percent level, and *** at the 1 percent level. Data are real import and export growth from the International Monetary Fund.

*Source:* Author's calculations.