

“Legacies, Clouds, Uncertainties”

IMF, *World Economic Outlook*, October 2014

Global current account (“flow”) imbalances have narrowed significantly since their peak in 2006, and their configuration has changed markedly in the process. The imbalances that used to be the main concern—the large deficit in the United States and surpluses in China and Japan—have more than halved. But some surpluses, especially those in some European economies and oil exporters, remain large, and those in some advanced commodity exporters and major emerging market economies have since moved to deficit. This chapter argues that the reduction of large flow imbalances has diminished systemic risks to the global economy. Nevertheless, two concerns remain. First, the nature of the flow adjustment—mostly driven by demand compression in deficit economies or growth differentials related to the faster recovery of emerging market economies and commodity exporters after the Great Recession—has meant that in many economies, narrower external imbalances have come at the cost of increased internal imbalances (high unemployment and large output gaps). The contraction in these external imbalances is expected to last as the decrease in output due to lowered demand has likely been matched by a decrease in potential output. However, there is some uncertainty about the latter, and there is the risk that flow imbalances will widen again. Second, since flow imbalances have shrunk but not reversed, net creditor and debtor positions (“stock imbalances”) have widened further. In addition, weak growth has contributed to increases in the ratio of net external liabilities to GDP in some debtor economies. These two factors make some of these economies more vulnerable to changes in market sentiment. To mitigate these risks, debtor economies will ultimately need to improve their current account balances and strengthen growth performance. Stronger external demand and more expenditure switching (from foreign to domestic goods and services) would help on both accounts. Policy measures to achieve both stronger and more balanced growth in the major economies, including in surplus economies with available policy space, would also be beneficial.

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Introduction

A worrying trend in the run-up to the global financial crisis was the widening of current account imbalances in some of the world’s largest economies. The concerns were fourfold: first, that some of the imbalances reflected domestic distortions, from large public deficits in some economies to excessive private saving in others, correction of which was in individual economies’ self-interest; second, that some of the imbalances might be reflecting intentional distortions, such as unfair trade practices or exchange rate policies, with adverse implications for trade partners; third, that a reduction in the U.S. current account deficit would likely require a slowdown in U.S. domestic demand growth, which—absent stronger demand elsewhere—would weaken global growth; and fourth, that the economies with large deficits and growing external liabilities, most notably the United States, might suffer an abrupt loss of confidence and financing, leading to massive disruptions of the international monetary and financial systems.¹

A decade later, where do we stand?

Flow imbalances—current account surpluses and deficits—have narrowed markedly, and inasmuch as they reflected domestic distortions, this narrowing has benefited both the economies suffering from them and the system as a whole. In addition, imbalances—especially deficits—have become less concentrated, so the risks of a sudden reversal (or the consequences thereof) are likely to have diminished. Two issues remain, however. How much of the narrowing is temporary and how much is permanent? And how worried should we be that net foreign asset positions have continued to diverge because flow imbalances have only narrowed rather than reversed?

Consensus on these issues has yet to emerge. Some view the large global imbalances of the mid-2000s as a past phenomenon, unlikely to return; others, how-

¹See, for example, the September 2006 *World Economic Outlook*, as well as IMF 2007 and its discussion by the IMF Executive Board (<https://www.imf.org/external/np/sec/pn/2007/pn0797.htm>).

ever, are more skeptical that the adjustment that has taken place will prove durable, and they urge greater policy action to address the remaining imbalances.² These opposing perspectives (and their accompanying policy prescriptions) suggest that there is a need to better understand the mechanics of adjustment and the extent to which the domestic and international distortions that underlay the precrisis imbalances have been addressed.

This chapter thus assesses whether global imbalances remain—or might again become—a matter of concern. To do so, it traces the evolution of global imbalances before and after the global financial crisis and seeks to answer the following key questions:

- How has the distribution of flow imbalances changed over time as they have narrowed? Has the narrowing been due more to expenditure changing or to expenditure switching from foreign to domestic goods and services? Will imbalances widen again as output gaps are closed?
- How have stock imbalances evolved? What are the underlying forces, and what are the likely future dynamics?

The main findings are as follows:

- With the narrowing of systemic current account balances, the configuration of global imbalances has shifted markedly since their peak in 2006. The imbalances that were the main concern at the time—the large deficit of the United States and the large surpluses of China and Japan—have all decreased by at least half relative to world GDP. At the same time, though not the original focus of concerns about global imbalances, the unsustainability of some large European deficits became apparent, and these economies have been undergoing often painful external adjustment.
- Beyond these major changes, the pattern of surpluses and deficits has changed in other ways. Some major emerging market economies and a few advanced commodity exporters have moved from

surplus to deficit. The surpluses of oil exporters and those of European surplus economies, however, remain quite large.

- Corrective movements in real effective exchange rates (currency depreciations for deficit economies, appreciations for surplus economies) have played a surprisingly limited role overall, and hence so has expenditure switching.³ Much of the recent adjustment in flow imbalances has therefore been driven by the reduction in demand in deficit economies after the global financial crisis or by growth differentials related to the faster recovery of emerging market economies and commodity exporters after the Great Recession. Factors that may have worked against anticipated exchange rate realignment include changes in investor sentiment (for example, safe haven flows after the crisis) and the fact that the euro area includes economies with both large precrisis deficits and large precrisis surpluses. Also, other shocks (such as increased energy production in the United States and the decline of energy production in Japan following the 2011 earthquake) would have implied reductions in the absolute size of current account balances for given exchange rates.
- The decrease in output due to lowered demand has been largely matched by a decrease in potential output. Thus, even without expenditure switching, much of the narrowing of the imbalances in deficit economies should be seen as permanent. However, the size of output gaps is highly uncertain, including in some euro area deficit economies, and therefore so is the future path of current account balances.
- Stock imbalances have not decreased—on the contrary, they have widened—mainly because of continued flow imbalances, coupled with low growth in several advanced economies. Some large debtor economies thus remain vulnerable to changes in market sentiment, highlighting continued possible systemic risks, though the status of the U.S. dollar as a reserve currency seems, if anything, more secure now than in 2006.

The chapter proceeds by first documenting the reduction in global imbalances since 2006 and examin-

²Eichengreen (2014) argues that global imbalances are over because neither the United States (the largest deficit economy in 2006) nor China (the largest surplus economy in 2006) will return to precrisis growth and spending patterns. Lane and Milesi-Ferretti (2012) find that although current account imbalances have been corrected, the external adjustment has been unbalanced, relying mostly on a reduction in demand in deficit economies. El-Erian (2012) warns of complacency, arguing that although global imbalances have narrowed, there remains a need to implement policy changes to address the remaining domestic and international distortions that underlie global imbalances.

³The September 2006 *World Economic Outlook*, for instance, argued that a “gradual and orderly unwinding of imbalances” was the most likely outcome, with a sustained depreciation of the U.S. dollar in real terms and a real effective exchange rate appreciation in surplus economies. Obstfeld and Rogoff (2005) noted that any significant improvement in the U.S. trade balance would typically involve a large depreciation of the U.S. dollar in real terms.

ing their changing constellation during that period. It then examines the mechanics of the adjustments that took place and considers whether global imbalances could widen again with a pickup in global growth. Finally, the chapter addresses the dynamics of stock imbalances, considers how both stock and flow imbalances are likely to evolve, and offers conclusions.

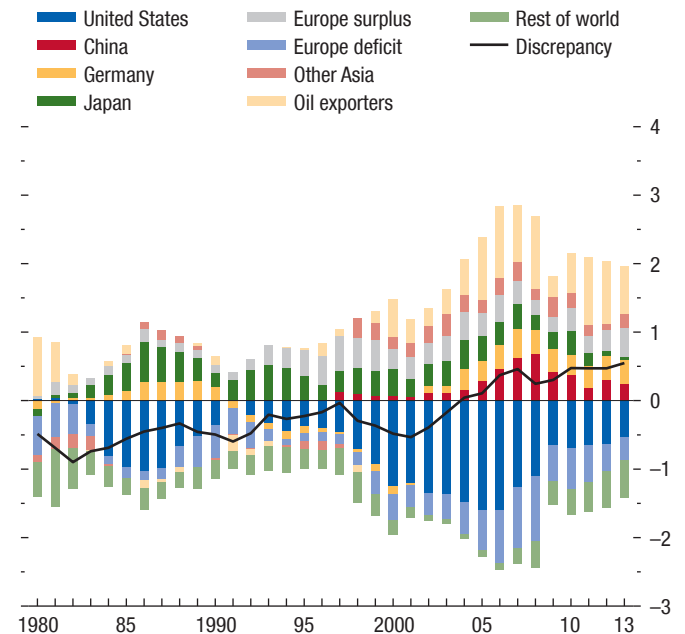
Narrowing the Bulge: The Evolution of Flow Imbalances

At the level of an individual country, there is no presumption that the current account should be balanced, and there may be good economic reasons to run current account surpluses or deficits. Large deficits—and associated large net foreign financial liabilities—however, expose the country to the risks of a sudden cessation in financing or the rolling over of those liabilities. If the economy is systemically important, a “sudden stop” of such financing could have wider repercussions. Large surpluses present fewer risks, but they can be problematic from a multilateral perspective if they are driven by export-led growth strategies or if they arise in a world of deficient aggregate demand—as has been the case since the global financial crisis. Indeed, distortions may be transmitted globally through surpluses and deficits if they occur in large economies, undermining the efficient operation of the international monetary system. And the more concentrated the imbalances, the greater the risks to the global economy. The configuration of current account imbalances in the mid-2000s, with large deficits for the United States and large surpluses for China and Japan, is widely understood to have met those criteria for systemic risk. This section documents the evolution of global imbalances since 2006, without passing judgment (yet) on the desirability of their dynamics.

Current account imbalances have narrowed substantially since their peak eight years ago, shortly before the global financial crisis (Figure 4.1). At that time, the sum of the absolute values of current account balances across all economies peaked at 5.6 percent of world GDP. Global imbalances subsequently shrank by almost one-third in 2009 at the height of the global recession. They rebounded somewhat in 2010 but have narrowed again since, declining to about 3.6 percent in 2013. Likewise, from 2006 through 2013, the aggregate imbalance of the top 10 deficit economies dropped by nearly half as a percentage of world GDP, from 2.3 percent to 1.2 percent (Table 4.1), and the corresponding value for

Figure 4.1. Global Current Account (“Flow”) Imbalances
(Percent of world GDP)

Current account imbalances have narrowed substantially since their peak eight years ago, and their configuration has changed markedly.



Source: IMF staff calculations.

Note: Oil exporters = Algeria, Angola, Azerbaijan, Bahrain, Bolivia, Brunei Darussalam, Chad, Republic of Congo, Ecuador, Equatorial Guinea, Gabon, Iran, Iraq, Kazakhstan, Kuwait, Libya, Nigeria, Norway, Oman, Qatar, Russia, Saudi Arabia, South Sudan, Timor-Leste, Trinidad and Tobago, Turkmenistan, United Arab Emirates, Venezuela, Yemen; Other Asia = Hong Kong SAR, India, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan Province of China, Thailand. European economies (excluding Germany and Norway) are sorted into surplus or deficit each year by the signs (positive or negative, respectively) of their current account balances.

the top 10 surplus economies dropped by one-fourth, from 2.1 percent to 1.5 percent.

The constellation of deficits and surpluses also changed by 2013 (Table 4.1; Figures 4.2 and 4.3). On the deficit side, the large U.S. deficit shrank by half in dollar terms and by almost two-thirds as a percentage of world GDP. European economies with large deficits—though not the focus of initial concerns about imbalances—moved as a whole to a small surplus (Greece, Italy, Poland, Portugal, and Spain). Deficits in some advanced commodity exporters (Australia and Canada) rose, and those of some major emerging market economies (Brazil, India, Indonesia, Mexico, and Turkey), some of which had run surpluses in 2006,

Table 4.1. Largest Deficit and Surplus Economies, 2006 and 2013

2006				2013			
	Billions of U.S. Dollars	Percent of GDP	Percent of World GDP		Billions of U.S. Dollars	Percent of GDP	Percent of World GDP
1. Largest Deficit Economies							
United States	-807	-5.8	-1.60	United States	-400	-2.4	-0.54
Spain	-111	-9.0	-0.22	United Kingdom	-114	-4.5	-0.15
United Kingdom	-71	-2.8	-0.14	Brazil	-81	-3.6	-0.11
Australia	-45	-5.8	-0.09	Turkey	-65	-7.9	-0.09
Turkey	-32	-6.0	-0.06	Canada	-59	-3.2	-0.08
Greece	-30	-11.3	-0.06	Australia	-49	-3.2	-0.07
Italy	-28	-1.5	-0.06	France	-37	-1.3	-0.05
Portugal	-22	-10.7	-0.04	India	-32	-1.7	-0.04
South Africa	-14	-5.3	-0.03	Indonesia	-28	-3.3	-0.04
Poland	-13	-3.8	-0.03	Mexico	-26	-2.1	-0.03
Total	-1,172		-2.3	Total	-891		-1.2
2. Largest Surplus Economies							
China	232	8.3	0.46	Germany	274	7.5	0.37
Germany	182	6.3	0.36	China	183	1.9	0.25
Japan	175	4.0	0.35	Saudi Arabia	133	17.7	0.18
Saudi Arabia	99	26.3	0.20	Switzerland	104	16.0	0.14
Russia	92	9.3	0.18	Netherlands	83	10.4	0.11
Netherlands	63	9.3	0.13	Korea	80	6.1	0.11
Switzerland	58	14.2	0.11	Kuwait	72	38.9	0.10
Norway	56	16.4	0.11	United Arab Emirates	65	16.1	0.09
Kuwait	45	44.6	0.09	Qatar	63	30.9	0.08
Singapore	37	25.0	0.07	Taiwan Province of China	58	11.8	0.08
Total	1,039		2.1	Total	1,113		1.5

Source: IMF, World Economic Outlook database.

moved up to occupy the remaining top 10 spots.⁴ Overall, the concentration of deficits also fell dramatically: in dollar terms, the top 5 economies in 2006 accounted for 80 percent of the global deficit; in 2013, the top 5 accounted for less than 65 percent of the (reduced) total.

On the other side, China's surplus almost halved in relation to world GDP, putting it second to that of Germany. Also especially notable is Japan, nearly tied for second place in 2006 but absent from the top 10 in 2013. Major factors behind the decline of China's surplus were sharply higher investment, expansionary fiscal policy in response to the global financial crisis, booms in credit and asset prices, and lower external demand—all of which were reflected in substantial nominal and real effective exchange rate appreciation. Japan's trade balance moved into deficit for the

first time since 1980, in part because of higher energy imports after the Great East Japan earthquake, the disruption to exports after the earthquake as well as the Thai floods, and increased public spending since the crisis. The surpluses of some European economies (Germany, Netherlands, Switzerland), by contrast, together with those of oil exporters, remained large.⁵ Although Norway and Russia (and Singapore) dropped out of the top 10, Qatar and the United Arab Emirates joined that group, along with the Republic of Korea and Taiwan Province of China. The share of the top 5 economies in the global dollar surplus barely changed, with those economies accounting for about half the total.

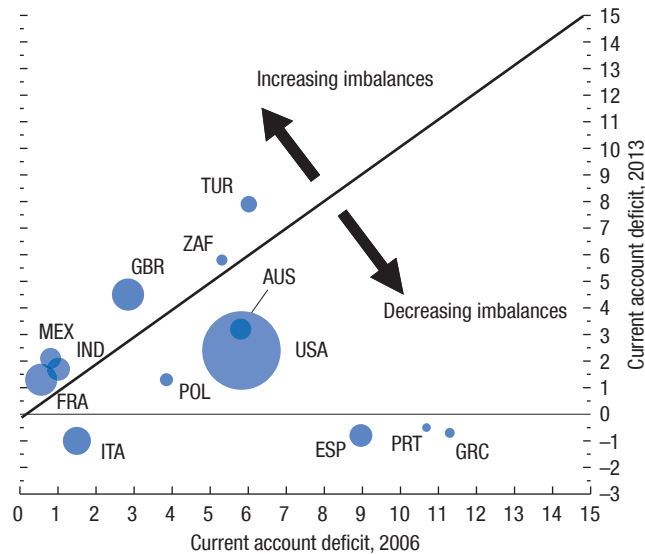
Therefore, in the most recent picture, the overall constellation of global imbalances looks quite different than that in 2006. What brought about this change and whether the narrowing of the imbalances is likely to persist are the subjects of the next two sections.

⁴See Chapter 1 of the October 2014 *Global Financial Stability Report*, which focuses on the growth of U.S. dollar corporate liabilities and private sector leverage in these emerging market economies, underlining that in most cases, the larger debtor positions have not been accompanied by larger fixed investments and higher growth.

⁵For at least some oil exporters, current account surpluses are insufficient from an intergenerational equity perspective.

Figure 4.2. Largest Deficit Economies, 2006 and 2013
(Percent of GDP)

The large U.S. deficit shrank by more than half as a percent of its own GDP between 2006 and 2013. The largest European deficit economies also moved as a whole to a small surplus.



Source: IMF staff estimates.

Note: Size of bubble is proportional to the share of the economy in world GDP. Data labels in the figure use International Organization for Standardization country codes.

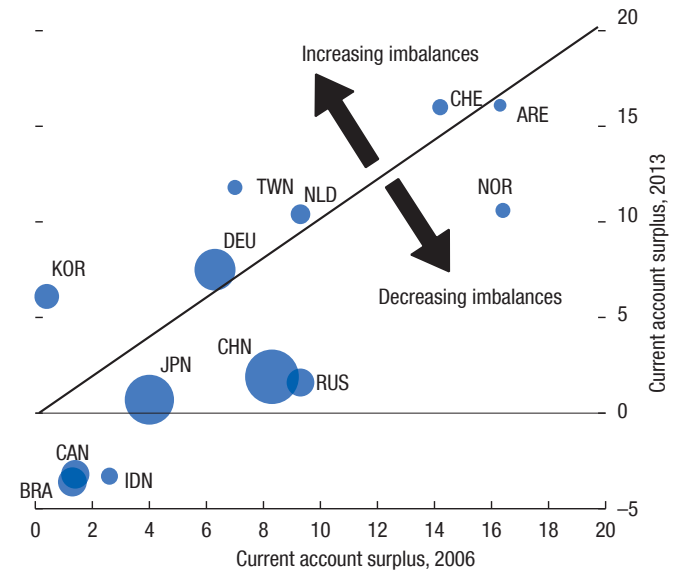
The Mechanics of the Adjustment

In principle, external adjustment can take place through changes in aggregate expenditure or changes in its composition. In practice, adjustment in deficit economies often takes place through expenditure reduction. That is certainly the case for the 2006–13 period (see, for example, Lane and Milesi-Ferretti 2014). This has meant that the squeeze in external (flow) imbalances was accompanied by a substantial widening of internal imbalances, that is, greater economic slack (to the extent that the declines in output in deficit economies have been cyclical, driven only by temporarily low demand). In a number of deficit economies, mostly advanced, the adjustment took place amid the typical legacy of financial crisis: a downshift in the path of output relative to precrisis trends (approximated by the medium-term output forecasts from the October 2006 *World Economic Outlook*).

The panels in Figure 4.4—which show a number of key variables for the main individual deficit and surplus economies established in Table 4.1, as well as

Figure 4.3. Largest Surplus Economies, 2006 and 2013
(Percent of GDP)

The large current account surpluses in China and Japan fell substantially as a percentage of national GDP between 2006 and 2013. A number of northern European and advanced Asian economies were running even greater surpluses by 2013, while some major emerging market economies moved from surpluses to deficits.



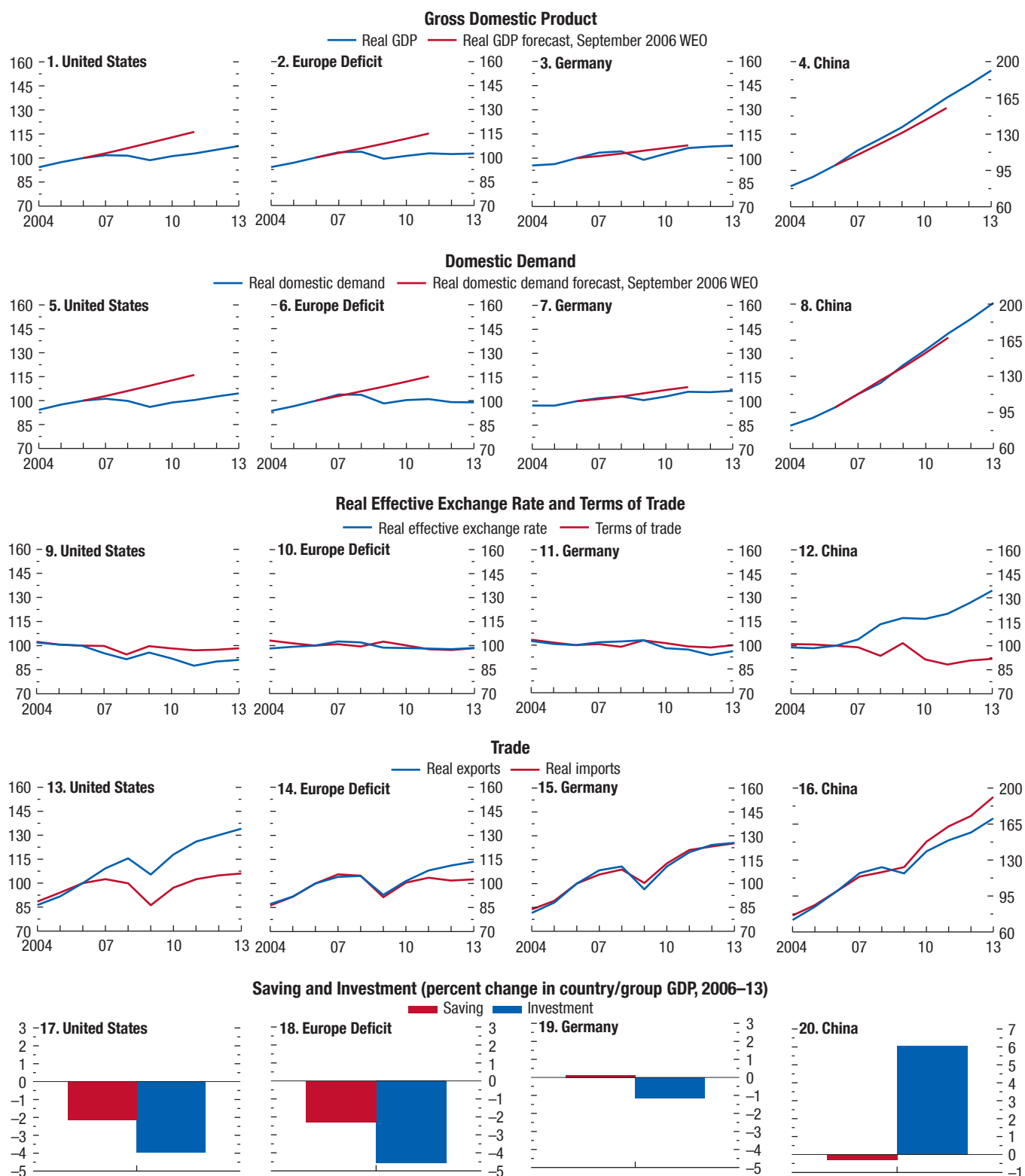
Source: IMF staff estimates.

Note: Size of bubble is proportional to the share of the economy in world GDP. Data labels in the figure use International Organization for Standardization country codes. Kuwait, Qatar, and Saudi Arabia are outliers and are not shown.

for various groups of economies—highlight the downshift in output for the United States and European deficit economies. The output contractions were highly synchronized across advanced economies, in deficit and surplus economies alike, as were the declines in output paths. Nevertheless, the output contractions and downshifts were typically smaller, relatively speaking, in surplus economies, which experienced only mild financial crises, if any, and were mostly hit by spillovers. In China and other emerging market economies, output remained close to precrisis trends.

If the reduction in demand and output in deficit economies was the main mechanism for the post-2006 adjustment in global imbalances (and trade spillovers one of the transmission mechanisms), one would expect to see a relatively stronger export contraction in major surplus economies. This was indeed the case in China and oil exporters, and to a lesser extent in Japan, where exports contracted more than imports. The relatively stronger economic conditions in surplus

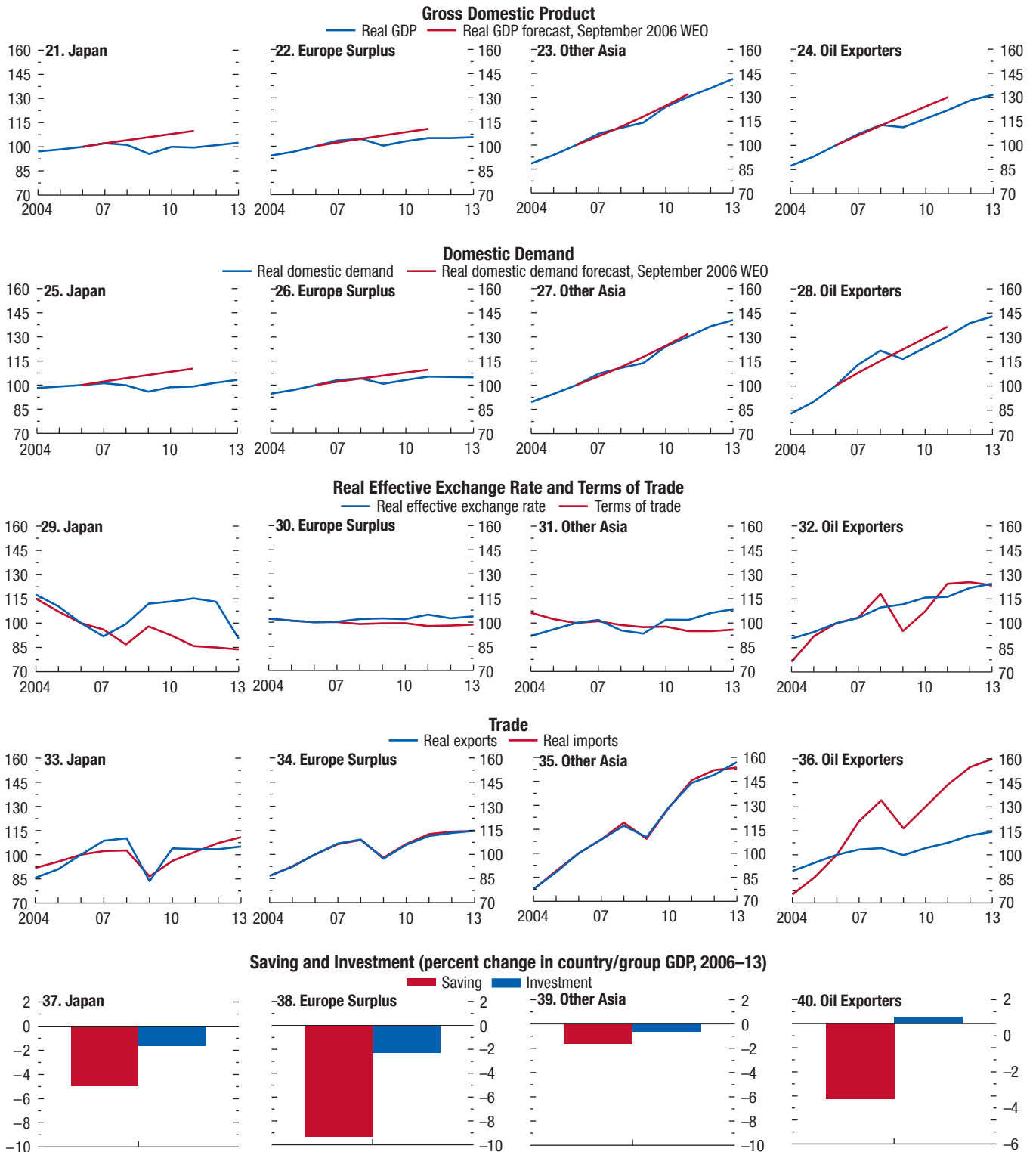
Figure 4.4. Key Indicators of External Adjustment, 2006 Episode
(Index, 2006 = 100 unless noted otherwise)



Source: IMF staff calculations.

Note: Europe deficit = Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, France, Greece, Hungary, Iceland, Ireland, Italy, Kosovo, Latvia, Lithuania, FYR Macedonia, Malta, Montenegro, Poland, Portugal, Romania, Serbia, Slovak Republic, Slovenia, Spain, Turkey, United Kingdom; Europe surplus = Austria, Belgium,

Figure 4.4. Key Indicators of External Adjustment, 2006 Episode (continued)
(Index, 2006 = 100 unless noted otherwise)



Denmark, Finland, Luxembourg, Netherlands, Sweden, Switzerland; Other Asia = Hong Kong SAR, India, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan Province of China, Thailand; Oil exporters = Algeria, Angola, Azerbaijan, Bahrain, Bolivia, Brunei Darussalam, Chad, Republic of Congo, Ecuador, Equatorial Guinea, Gabon, Iran, Iraq, Kazakhstan, Kuwait, Libya, Nigeria, Norway, Oman, Qatar, Russia, Saudi Arabia, South Sudan, Timor-Leste, Trinidad and Tobago, Turkmenistan, United Arab Emirates, Venezuela, Yemen.

economies thus broadly led to some demand rebalancing between deficit and surplus economies.

Weak domestic demand mainly reflected a sharp contraction in investment expenditure in most economies, but more so for deficit economies than for those in surplus. This, in turn, helped narrow the current account imbalances of advanced deficit economies (for example, the United States and a number of European deficit economies) and at the same time improved the financial net lending and borrowing positions of households and nonfinancial corporations. Although aggregate investment also fell in advanced surplus economies (for example, Japan and several northern European economies), this decline was more than offset by a reduction in aggregate saving, which led to an overall narrowing of their surpluses.⁶ In contrast, China, the largest surplus economy in 2006, experienced a significant increase in investment, which, compounded by a small decline in national saving, resulted in a substantial narrowing of its current account surplus.⁷

Such rebalancing continued because many surplus economies, emerging market economies in particular, recovered faster from the global financial crisis than advanced economies in deficit. The sources of the differential reflected not only macroeconomic policy stimulus, notably in China, but also strong capital inflows, the rebound in commodity markets, and gains in terms of trade, which also boosted domestic demand.

These growth differentials supported further demand rebalancing, leading to relatively faster growth of import volumes and a rising divergence of the path for export volume from that for import volume. Current account surpluses declined, with some major emerging market economies experiencing current account reversals. Oil exporters were the main exception; their current account balances improved with higher oil prices, notwithstanding rapid import growth. The flip side to the rising terms of trade for commodity exporters was terms-of-trade losses in commodity importers, including in deficit economies; all else equal, the terms-of-trade losses

lowered the improvements in external current accounts in nominal terms or as a percentage of GDP.

Real currency appreciation in some surplus economies and depreciation in some deficit economies suggest that some expenditure switching has taken place in the recent narrowing of imbalances. Currency appreciation in China, commodity exporters, and emerging market economies stands out on the surplus side; dollar depreciation has helped in the United States. In contrast, there has been little real appreciation in Japan or depreciation in European deficit and European surplus economies. This underscores how pegged currencies and downward nominal rigidities in a number of stressed deficit economies, notably in the euro area, have constrained the relative price adjustment needed for the reallocation of resources between tradables and nontradables. The CPI-based real effective exchange rate measure used in the analysis may, however, understate the impact of changes in relative prices on the current account relative to other measures, such as relative unit labor costs. Unfortunately, unit-labor-cost-based real effective exchange rates are available only for a relatively limited set of (mostly advanced) economies.

The relationship between a country's 2006 current account balance and the subsequent growth in domestic demand relative to that of its trading partners is positive and statistically significant (Figure 4.5). That is, economies with surpluses (deficits) experienced faster (slower) demand growth compared with their partners. The same is true of the subsequent change in the value of currencies (Figure 4.6): economies with surpluses (deficits) experienced real appreciations (depreciations) relative to their trading partners.

Although both expenditure reduction and expenditure switching have been at play, the subsequent adjustment in current account balances has been more strongly related to changes in relative domestic demand (Figure 4.7) than to changes in the real effective exchange rate (Figure 4.8). More formal analysis is afforded by a panel regression of the annual change in the current account (as a share of GDP) on the change in aggregate demand relative to that in trading partners, changes in the real effective exchange rate, and changes in the terms of trade. The regression yields statistically significant coefficients with the expected sign for all explanatory variables.⁸ The R^2 of

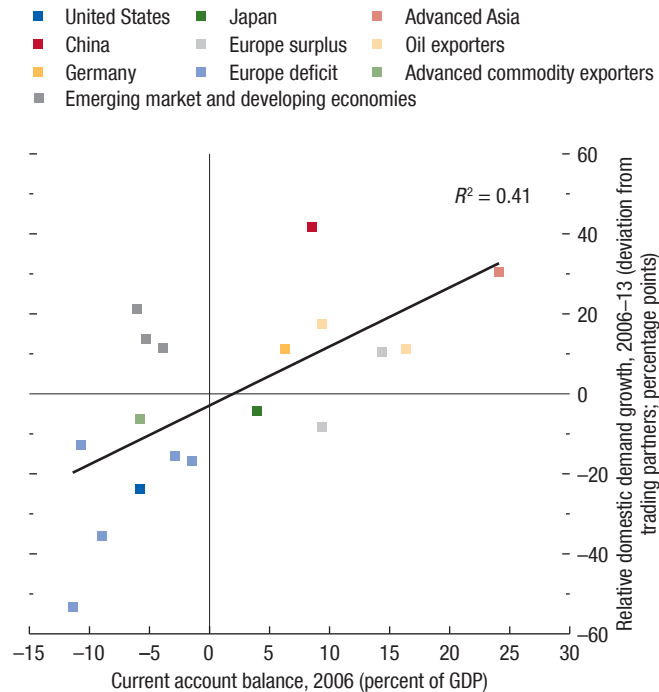
⁶Germany was the exception, with a relatively larger decrease in overall investment relative to saving, leaving it as the only large surplus economy to experience a widening of its surplus.

⁷Much of the increase in the investment-to-GDP ratio (5.5 percentage points) took place during the period 2006–09. The saving rate also increased during this period, partly offsetting the impact on the current account surplus, which fell by 3.5 percentage points. Since 2009 the saving rate has declined and the investment-to-GDP ratio has increased modestly, with a further 2.8 percentage point adjustment in the current account.

⁸The panel consists of 64 economies for the period 1970–2013; see Appendix 4.2 for details. The real effective exchange rate is potentially endogenous to the current account, which tends to bias the coefficient downward, so the finding of a statistically significant negative coefficient is despite, not because of, any endogeneity bias.

Figure 4.5. Growth of Domestic Demand Relative to Trading Partners versus 2006 Current Account

Economies with surpluses (deficits) in 2006 typically experienced faster (slower) domestic demand growth relative to that of their trading partners between 2006 and 2013.



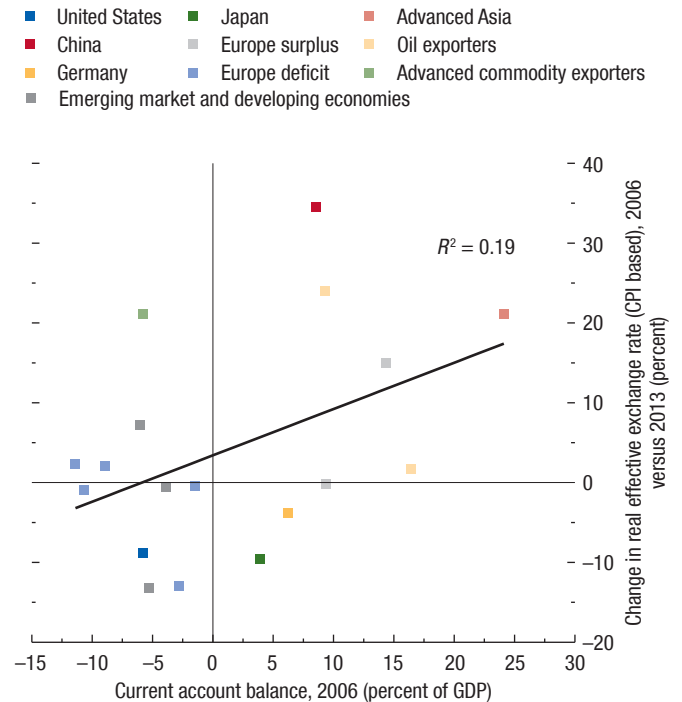
Source: IMF staff calculations.

Note: The deviation of domestic demand growth from that of trading partners is calculated as the difference between the deviation of real domestic demand growth (2006–13) from its preadjustment trend (1996–2003) and the deviation of domestic demand growth in trading partners (2006–13) from its preadjustment trend (1996–2003). Advanced commodity exporters = Australia; Advanced Asia = Singapore; Emerging market and developing economies = Poland, South Africa, Turkey; Europe deficit = Greece, Italy, Portugal, Spain, United Kingdom; Europe surplus = Netherlands, Switzerland; Oil exporters = Norway, Russia.

the regression (including lags of all explanatory variables) is 0.41; dropping the aggregate demand terms lowers it to 0.10, but dropping the real effective exchange rate term lowers it only to 0.39. In other words, the real effective exchange rate, though statistically significant, adds little to the explanatory power of the regression. For the 2007–13 period, the relative importance of the demand terms is even more apparent: the (implied) R^2 of the full model for this period is 0.51; without the demand terms it is 0.02, and without the real effective exchange rate term, it is 0.51. The importance of expenditure reduction in the recent adjustment can also be gauged by comparing the implied 2013 level of aggregate (surplus and deficit) global imbalances with, and without, the effect of the real

Figure 4.6. Change in Real Effective Exchange Rate (CPI Based) versus 2006 Current Account
(Percent)

Economies with surpluses (deficits) in 2006 typically experienced real appreciations (depreciations) relative to that of their trading partners between 2006 and 2013.



Source: IMF staff calculations.

Note: CPI = consumer price index. Advanced commodity exporters = Australia; Advanced Asia = Singapore; Emerging market and developing economies = Poland, South Africa, Turkey; Europe deficit = Greece, Italy, Portugal, Spain, United Kingdom; Europe surplus = Netherlands, Switzerland; Oil exporters = Norway, Russia.

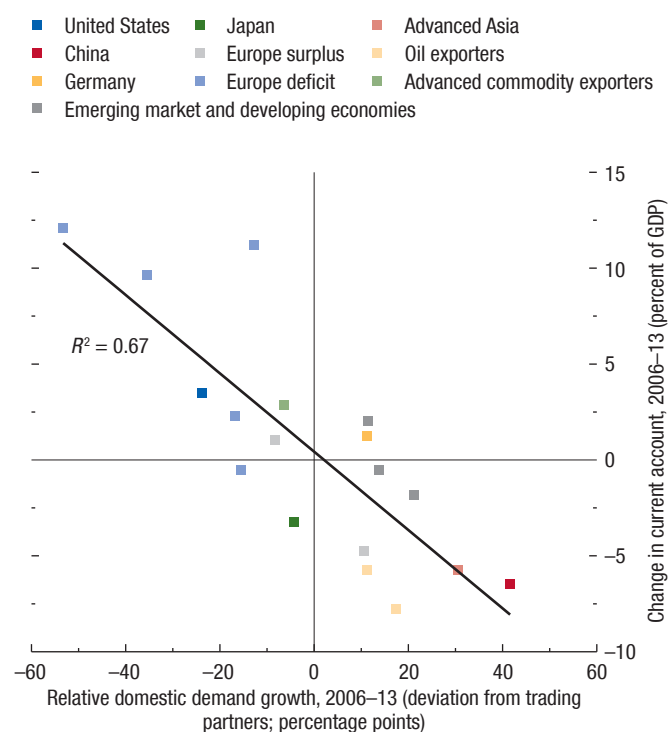
effective exchange rate movement; the latter is higher by only 0.4 percent of world GDP, while the overall reduction in imbalances for the 64 economies in the sample was 2.7 percent of world GDP.

The limited explanatory power of the real effective exchange rate in the current account adjustment reflects a number of factors beyond the generally dominant role of demand changes in a global crisis context. Structural and institutional factors limited real effective exchange rate adjustment in some cases, notably within the euro area.⁹ In the case of the United States and Japan, shocks to domestic energy production may

⁹On implications of the nominal exchange rate regime for the persistence of current account imbalances, see Ghosh, Qureshi, and Tsangarides 2014.

Figure 4.7. Changes in Domestic Demand and Current Account

Expenditure reduction played an important role in current account adjustment between 2006 and 2013. Economies with a larger (smaller) contraction in domestic demand relative to that of their trading partners typically experienced a larger (smaller) improvement in their current account balances.



Source: IMF staff calculations.

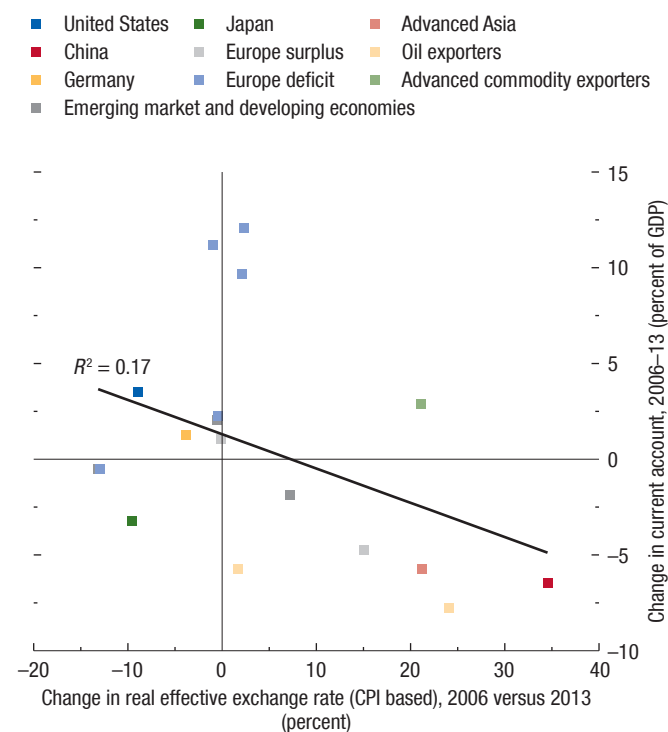
Note: Advanced commodity exporters = Australia; Advanced Asia = Singapore; Emerging market and developing economies = Poland, South Africa, Turkey; Europe deficit = Greece, Italy, Portugal, Spain, United Kingdom; Europe surplus = Netherlands, Switzerland; Oil exporters = Norway, Russia.

have weakened the relation between exchange rate changes and current account adjustment. In the case of the United States, for example, increased production of tight oil led to current account improvements, while the underlying equilibrium exchange rate likely appreciated. Finally, changes in investor sentiment have sometimes worked against real effective exchange rate realignment, including, for example, in the case of safe haven flows.

The 2006–13 episode is not, of course, the first time that global imbalances have contracted: previous occasions include 1974 and 1986. The latter provides an instructive contrast with the current instance (Box 4.1): the real effective exchange rate pictures were broadly similar, with the yen appreciating substantially in real

Figure 4.8. Changes in Real Effective Exchange Rate and Current Account

Expenditure switching also was at work in current account adjustment between 2006 and 2013. Economies with depreciated (appreciated) currencies typically experienced an improvement (deterioration) in their current account balances.



Source: IMF staff calculations.

Note: CPI = consumer price index. Advanced commodity exporters = Australia; Advanced Asia = Singapore; Emerging market and developing economies = Poland, South Africa, Turkey; Europe deficit = Greece, Italy, Portugal, Spain, United Kingdom; Europe surplus = Netherlands, Switzerland; Oil exporters = Norway, Russia.

effective terms in that episode while the dollar depreciated. No other currencies changed notably in real effective terms. In the former West Germany, for example, real appreciation began only with reunification in 1990. If anything, the reach of exchange rate changes has been broader in the current episode, with the currencies of major emerging market economies and commodity exporters also appreciating.

The main difference between these adjustment episodes is in the growth environment. Whereas in 1986 the narrowing of imbalances took place in the context of growth rotating above preadjustment trends, the narrowing in the current instance has occurred in the context of the global financial crisis, with likely permanent losses in output levels and, in some cases, even

lower trend growth. Not surprisingly, demand reduction has contributed more to the recent narrowing than in 1986, and expenditure switching correspondingly less.

Juxtaposing the external adjustment of the worst-affected East Asian crisis economies in the late 1990s with that of four of the euro area economies most severely affected by the recent crises provides another useful comparison (Box 4.2). Massive and sustained real depreciations, together with a supportive external environment, allowed the East Asian economies to benefit from expenditure switching. By contrast, the four stressed euro area economies during the current episode have experienced only limited expenditure switching so far: the adjustment of relative prices through internal devaluation has been gradual and more painful, hurting their growth prospects (see, for instance, Tresselt and others 2014).¹⁰ The narrowing of global imbalances during the current episode is thus bracketed by the two extremes of the East Asian and the euro area experiences.

Overall, the limited role of exchange rate adjustments in the narrowing of imbalances has meant that that process has entailed high economic and social costs—most notably, high rates of unemployment and large output gaps—partly because resources were not quickly reallocated between tradables and nontradables sectors. However, it has also allowed for substantial adjustment without disruptive exchange rate adjustments to the major reserve currencies (most notably, the dollar) that some feared before the global financial crisis. In the process, the distortions underlying the large imbalances up to about 2006, that is, asset price bubbles and credit booms in many advanced economies, have also largely corrected—though others may have emerged, including because of the expansionary policies that the crisis has engendered.

The Durability of the Adjustment

How lasting is the observed narrowing of current account imbalances likely to be? There are two elements to this question. Mechanically, as activity recovers and output gaps start to close, domestic demand will rebound in deficit economies; the concern is that without sufficient expenditure switching, this rebound

could lead to a renewed widening of external imbalances.¹¹ Going beyond such mechanics, it is worth asking whether the policy and other distortions that underlie global imbalances have diminished, especially because—other than the risk of a sudden stop—it is these distortions that carry implications for multilateral welfare. Moreover, inasmuch as policy and other distortions do not—or should not—reappear, the extent to which they have diminished speaks to the durability of the observed adjustment.

Output Gaps and Imbalances

Whether global imbalances will, in the absence of further expenditure switching, again expand as the recovery gets under way is closely linked to the issue of whether output declines in deficit economies since the global financial crisis have been largely cyclical or structural. Experience from past financial crises suggests that potential output often declines and the country never recovers its precrisis growth path (see Cerra and Saxena 2008), but it is extraordinarily difficult to arrive at a definitive judgment—especially in regard to what happens after a far-reaching global financial crisis.

To determine the sensitivity of estimates of the extent to which the observed narrowing of flow imbalances will reverse as output gaps close, Figure 4.9 presents different scenarios using alternative assumptions about output gaps, estimates of which are subject to sizable uncertainty.¹² Between 2006 and 2013, global imbalances shrank by some 2.8 percent of world GDP.¹³ In a counterfactual scenario, mechanically setting the estimated 2013 output gaps from the *World Economic Outlook* (WEO) for the Group of Twenty economies to zero and comparing the cycli-

¹¹As noted previously, in the aggregate, real effective exchange rate movements have played only a minor role in the adjustment process to date—though there are some important individual exceptions; for instance, China's real effective exchange rate has appreciated by some 30 percent since 2007.

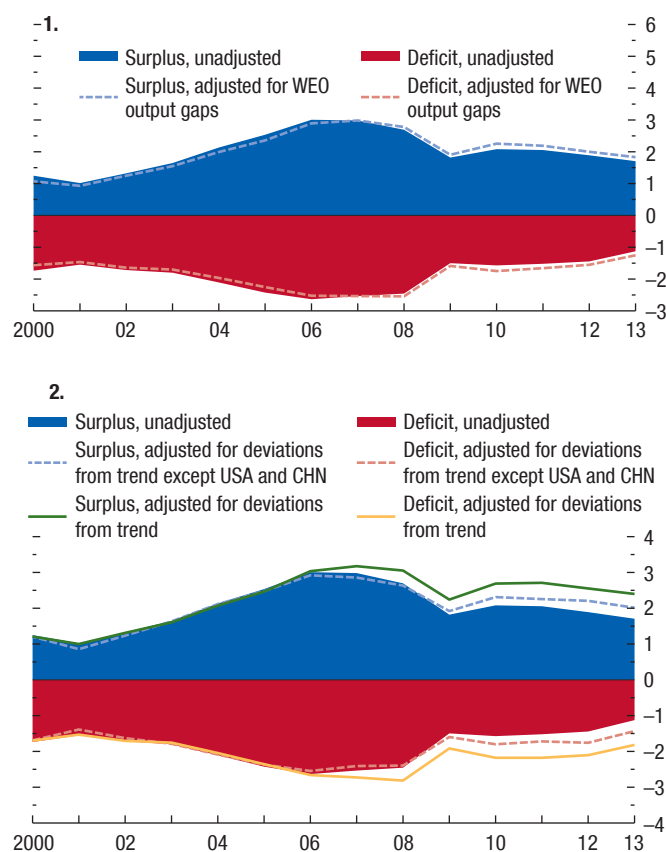
¹²This analysis was undertaken by Vladimir Klyuev and Joong Shik Kang; see Appendix 4.4 and Kang and Klyuev, forthcoming, for details.

¹³The sensitivity analysis is based on alternative assumptions about the output gaps of the Group of Twenty economies. Both in 2006 and in 2013, these economies accounted for more than three-quarters of global deficits and about one-half of global surpluses. The four largest economies—China, Germany, Japan, and the United States—accounted for 60 percent of total deficits and 40 percent of total surpluses in 2006 and 35 percent of total deficits and 31 percent of total surpluses in 2013.

¹⁰See Berger and Nitsch 2014 and Ghosh, Qureshi, and Tsangarides 2014 for evidence that imbalances within the euro area became more persistent with the adoption of the euro.

Figure 4.9. Current Account Balances, Cyclically Adjusted and Unadjusted
(Percent of world GDP)

The narrowing of current account imbalances since 2006 is likely to be long lasting, as cyclical factors appear to have played a relatively minor role. Even in the worst-case scenario, which results from estimating output gaps as the difference between the actual level of output in 2013 and the 2013 level extrapolated using precrisis trends, the current account narrowing amounts to around 1½ percent of world GDP (which is almost half the adjustment without cyclical factors).



Source: IMF staff calculations.

Note: Countries are classified as deficit or surplus based on their 2006 position. The trend is estimated in log of real GDP over the period 1998–2005. CHN = China; USA = United States.

cally adjusted global imbalance in 2013 with the actual level in 2006 yields a narrowing of 2.6 percent of world GDP (Figure 4.9, panel 1).¹⁴ The implication is that virtually all of the narrowing of global imbalances observed to date should be durable and should not reverse as output gaps close.

¹⁴Economies are classified as surplus or deficit based on their positions in 2006. Therefore, the adjustment of global imbalances reported in this section differs somewhat from that reported elsewhere in this chapter, where economies are classified as surplus or deficit according to their position each year.

This surprisingly modest estimate for the cyclical component of the global imbalances derives from the synchronicity of output gaps across economies (because it is the difference in output gaps that matters) and from the fact that the output gaps themselves are (relatively) small. In particular, in the WEO data, the economies that saw the greatest declines in output relative to precrisis trends also experienced the largest slowdowns in potential output growth, compressing the range of output gaps.

An alternative view is that an economy's capacity to produce cannot simply be destroyed in a financial crisis, whereas a sharp increase in uncertainty, pessimistic expectations, disruption of financing, and other factors could lead to large, but still temporary, decreases in demand. An extreme version of this view is that the full extent of the deviation of output from the 2013 level that would be implied by precrisis trends represents the output gap. Applying this alternative assumption naturally gives significantly larger cyclically adjusted global imbalances for 2013: a deficit of 1.8 percent of world GDP and a surplus of 2.3 percent of world GDP, for a total imbalance of 4.1 percent of world GDP (Figure 4.9, panel 2). The improvement in global imbalances since 2006 would then amount to only 1.5 percent of world GDP. Thus, in this scenario, almost half of the observed adjustment could be undone as output gaps close.

It turns out, however, that it is mainly the U.S. economy that is critical to this calculation. The WEO output gap for the United States in 2013 is 3.8 percent, whereas the trend-based alternative would imply a gap of 10.7 percent, which seems implausible and is hard to reconcile with, for example, improving labor market indicators. Returning to the WEO gap for the United States (keeping all others at their trend deviation gaps) in the counterfactual simulation, or returning to the WEO gaps for both the United States and China, restores the narrowing in the cyclically adjusted global imbalances since 2006 to about 2 percent of world GDP (Figure 4.9, panel 2).

Keeping in mind the sizable uncertainty surrounding estimates of output gaps (notably but not only for the euro area), this suggests that even under extreme assumptions about the size of output gaps, one-half of the observed shrinkage in global imbalances would remain as these gaps close; a more plausible gap assumption for the United States alone would mean that two-thirds should endure.

Distortions and Imbalances

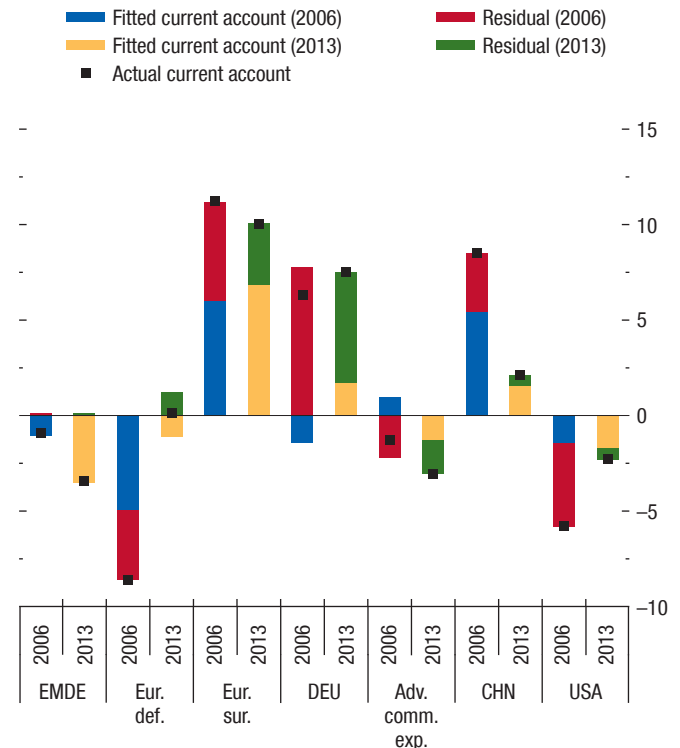
Concerns about global imbalances go beyond just their magnitude: from the outset, a key issue in debates has been the extent to which observed imbalances are manifestations of underlying policy distortions. A complementary approach to assessing the durability of the correction to date is therefore to ask whether the underlying distortions have diminished in the intervening years.

To this end, this section compares observed cyclically adjusted current account balances¹⁵ with those predicted using the IMF's External Balance Assessment (EBA) framework, which is an empirical model of current account determination. Put differently, the residuals from the EBA regression, also known in this context as "current account gaps," can be considered an indicator of the proportion of current account balances that cannot be explained by a country's macroeconomic fundamentals. They are thus a measure of excessive imbalances reflective of underlying distortions and possibly systemic risks.¹⁶ Three important caveats bear emphasizing. First, determining globally consistent measures of current account gaps remains difficult and is model specific. To the extent that the EBA model omits certain unobserved fundamentals, the residual imputes their effect to distortions. Second, some of the variables in the regression are policy variables, which need not necessarily be at desirable or sustainable settings. Although the EBA model in its operational form explicitly corrects for deviations between actual and desirable policies ("policy gaps"), time series of "desirable" policy settings are not available for historical data; in the exercise that follows, therefore, the 2013 estimates of desirable policy settings are applied to 2006 as well.¹⁷ Third, even for 2013, IMF staff assessments of current account gaps (provided in the IMF's *External Sector Report*) draw on the EBA-based current account gaps (and in most cases are very similar to them) but also reflect staff judgment.

Figure 4.10 reports the fitted and actual values of the current account for the major economies and

Figure 4.10. Largest Deficit and Surplus Economies: Current Account Gaps
(Percent of GDP, EBA fitted)

"Current account gaps"—the difference (marked as "residual") between actual current account balances and those predicted using the IMF's External Balance Assessment framework—in the largest deficit and surplus economies shrank between 2006 and 2013.



Source: IMF staff calculations.

Note: Adv. comm. exp. = Advanced commodity exporters (Australia, Canada); CHN = China; DEU = Germany; EBA = External Balance Assessment; EMDE = emerging market and developing economies (Brazil, India, Indonesia, Mexico, South Africa, Turkey); Eur. def. = Europe deficit (Greece, Poland, Portugal, Spain); Eur. sur. = Europe surplus (Netherlands, Switzerland); USA = United States. The country groups are averaged using market weights.

country groups identified in Figure 4.1, where the regression uses actual policy settings (so the residual abstracts from the effect on the current account of divergences of policies from their desirable values and implicitly captures only nonpolicy distortions).¹⁸

Figure 4.11 (panel 1) provides a more direct comparison of the residuals over time: bubbles (whose

¹⁵In what follows, "cyclically adjusted" refers to the WEO output gaps, not the trend deviation output gaps, which were used only for the alternative scenario for the counterfactual analysis earlier in the chapter.

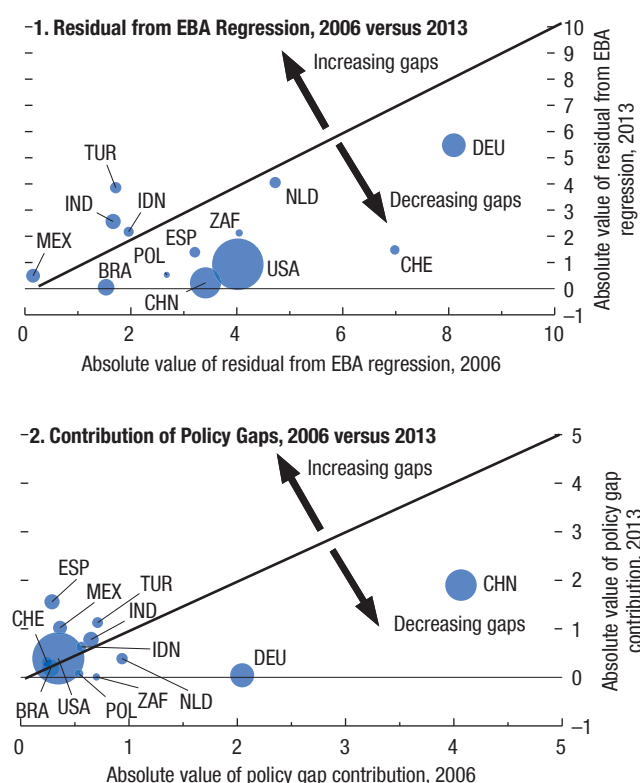
¹⁶These arguments are developed by Blanchard and Milesi-Ferretti (2012).

¹⁷Policy gaps or distortions are deviations of actual policy stances (that is, fiscal balances, health spending, foreign exchange intervention, private credit, and capital controls) from their desirable or appropriate levels (as determined by IMF country desks). At the same time, to ensure global consistency, domestic policies are considered relative to foreign policies.

¹⁸The EBA methodology has been developed by the IMF's Research Department to provide current account and exchange rate assessments for a number of economies from a multilateral perspective. The EBA framework has been operational only since 2011, so data on desirable policies for 2006 are not available. The EBA exercise does not cover Middle Eastern oil exporters, so these economies are not included in this analysis.

Figure 4.11. Understanding Changes in Distortions Using External Balance Assessment Regressions, 2006 versus 2013

Current account gaps fell between 2006 and 2013 for the largest and systemically most important economies. This suggests that underlying distortions and global risks also shrank. The contribution of policy gaps in most economies either narrowed or remained roughly unchanged, with the exception of a few emerging market economies. The latter implies that the current account gaps for these economies were larger than reported.



Source: IMF staff estimates.

Note: EBA = External Balance Assessment. Size of bubbles is proportional to the share of the economy in world GDP. Points below the 45-degree line indicate a smaller estimated residual in 2013 than in 2006; points above, a larger residual. Optimal policies are available only for 2013 and are assumed to be the same for 2006. Data labels in the figure use International Organization for Standardization country codes.

magnitude is proportional to the country's share of world GDP) that lie below the 45-degree line indicate a smaller current account gap in 2013 than in 2006. The general picture that emerges from the analysis is that current account gaps tended to decrease between 2006 and 2013 for the largest and systemically most important economies. As such, underlying distortions and global risks also became smaller. However, they did not disappear. In particular, whereas the current account gaps for China, European deficit economies, and the United States were close to zero

in 2013, they remained elevated for European surplus economies, including Germany.

The residuals above exclude the estimated effects of policy gaps, which are shown separately in Figure 4.11, panel 2. For a few (mostly emerging market) economies, the estimated effect of policy gaps on current account imbalances is larger in 2013 than it was in 2006. Adding these policy gaps to the residuals would therefore widen the current account gaps for these economies. In most cases, however, the net contribution of policy gaps to current account gaps either remained roughly constant or diminished between 2006 and 2013.

What policies were behind these improvements in the larger economies? In the United States, despite some improvement in the cyclically adjusted fiscal balance, since it is the difference in the balance relative to other trading partners that matters, the fiscal variable actually results in a slight widening of the policy gap between 2006 and 2013.¹⁹ A more telling improvement relates to excesses in the financial sector, which both the bust phase of the boom-bust cycle and tighter regulation have helped reduce.²⁰ The net change in the U.S. policy gap between 2006 and 2013, therefore, is roughly a wash—and the bubble for the United States in Figure 4.11 (panel 2) lies on the 45-degree line. In China, the policy improvement is captured by slower accumulation of foreign exchange reserves and some relaxation of capital controls, which are the counterparts to the substantial real effective exchange rate appreciation. The policy gap therefore shrinks significantly. Not all of the narrowing of the current account surplus is necessarily benign, however. Rather than a decline in saving, much of the change in China's current account between 2006 and 2013 comes through an increase in the already-high rate of investment, exacerbating concerns about allocative efficiency and financial stability and raising questions about its sus-

¹⁹The U.S. fiscal balance (relative to trading partners) improved through 2009, then deteriorated between 2010 and 2013, implying little difference between snapshots of 2006 and 2013.

²⁰In the EBA regression, most excesses are captured by the residual ("distortions") rather than policy variables such as the quality of financial regulation (which is difficult to quantify in a statistical analysis). The only policy variable proxying such excesses is the growth of the ratio of credit to GDP. This is why the bulk of the improvement in the current account gap for the United States shows up in the regression residual rather than in the effect of the policy gap variable. It is also why it would not be appropriate to make too sharp a distinction between "policy distortions" and "other distortions" in the analysis.

tainability. For Germany, the net impact of the policy gap shrinks because the effect of lower excessive credit growth (that is, credit growth greater than the rate of GDP growth) more than offsets the tightening of the fiscal balance (relative to trading partners), which itself contributes to widening Germany's current account surplus.

Although such analysis can never be definitive (being highly dependent on the model used to identify “fundamentals”), it does suggest that policy and other distortions have diminished along with the observed narrowing of flow imbalances during the past few years. The improvement in global imbalances thus is not only quantitative but rather represents, from a multilateral perspective, a qualitative improvement in welfare.²¹ Nevertheless, the European deficit economies' adjustment difficulties, which have resulted in massive import compression, unemployment, and economic dislocation, point to greater scope for surplus economies—especially, though not exclusively, those in the region—to rebalance their economies and switch expenditure toward foreign-produced goods. Moreover, the conclusion that reduced policy and other distortions have narrowed global imbalances is somewhat at odds with the finding in the preceding section that lower demand, largely matched by a decrease in potential output, has been responsible for much of the observed narrowing of global imbalances. These two observations may be reconciled to the extent that potential output was artificially high as a result of distortions—or (what amounts to the same thing) that output was above potential (including because of distortions in the financial sector), and the global financial crisis both resolved the distortions and lowered demand, bringing it more in line with potential output. This can only be a partial explanation, however, so the role of policy improvements and lower distortions in accounting for the narrower flow imbalances is likely to be limited.²²

²¹This is not to suggest, of course, that no distortions remain. The *2014 Pilot External Sector Report* (IMF 2014) discusses a variety of policies to further align current account balances with underlying fundamentals.

²²The low goods and services price inflation in the run-up to the global financial crisis suggests that output is unlikely to have been much above potential since, in that case, the low observed inflation would have meant that all of the excess demand was falling only on imported goods. Although (for instance) the United States indeed had a large current account deficit, it seems implausible that the excess demand would have fallen exclusively on imported goods.

The Stock Dimension of Imbalances

Going beyond flow analysis, the external balance sheet of a country—its international investment position in the balance of payments statistics—is another important dimension in global imbalances (see, for example, Obstfeld 2012a, 2012b). Economies with large net liability positions, in particular, may become vulnerable to disruptive external financial market conditions, including, in the extreme case, the sudden drying up of external financing (sudden stops) (see, for example, Catão and Milesi-Ferretti 2013).²³ Both in the global financial crisis and during the subsequent euro area crisis, such vulnerabilities played a prominent role, as a number of economies experienced sovereign debt problems, sudden stops, or both.

Comparing the 10 largest debtors and 10 largest creditors in 2006 and 2013 reveals striking inertia in these rankings (Table 4.2)—especially compared with those for current account balances (Table 4.1). This inertia exists because net foreign asset stocks are typically slow-moving variables. There is also some overlap between the top 10 list for flow imbalances and that for stock imbalances—which is to be expected, given the two-way feedback between the current account and net foreign asset dynamics (surpluses cumulate into rising stocks; higher net foreign assets generate more factor income, contributing to larger surpluses). The other striking fact about global stock imbalances—again, in contrast to flow imbalances—is that they continued to grow during the period 2006–13 (Figure 4.12), with little discernible change in pace after 2006, the year in which flow imbalances peaked. Moreover, they became, if anything, more concentrated on the debtor side, with the share of the top 5 economies rising from 55 percent of world output in 2006 to 60 percent in 2013. The trend of international financial integration has not been reversed, as might have been expected following the global financial crisis (Figure 4.13).

What explains the widening stock imbalances? When these imbalances are measured as a percentage of GDP, there can be three reasons for wider net foreign asset positions. The first is continued flow imbalances. Even a narrowing of these imbalances, as occurred during the period under consideration, is not enough, all else equal, for a decrease in stock imbal-

²³Flow imbalances are sometimes taken as indicating potential distortions of current policy settings, whereas stock imbalances reflect past policies; stock imbalances may, however, be relevant for current vulnerabilities.

Table 4.2. Largest Debtor and Creditor Economies (Net Foreign Assets and Liabilities), 2006 and 2013¹

Table 4.2: Largest Debtor and Creditor Economies (Net Foreign Assets and Liabilities), 2006 and 2013							
	2006				2013		
	Billions of U.S. Dollars	Percent of GDP	Percent of World GDP		Billions of U.S. Dollars	Percent of GDP	Percent of World GDP
1. Largest Debtor Economies							
United States	-1,973	-14.2	-3.92	United States	-5,698	-34.0	-7.64
Spain	-862	-69.7	-1.71	Spain	-1,400	-103.1	-1.88
United Kingdom	-762	-30.6	-1.51	Brazil ²	-750	-33.4	-1.01
Australia	-462	-59.2	-0.92	Italy	-739	-35.6	-0.99
Italy	-453	-24.1	-0.90	Australia	-746	-49.6	-1.00
Brazil ²	-349	-32.1	-0.69	France	-578	-20.6	-0.77
Mexico ²	-346	-35.8	-0.69	India ²	-479	-25.5	-0.64
Greece	-237	-90.4	-0.47	Mexico ²	-445	-35.3	-0.60
Turkey ²	-206	-39.0	-0.41	Turkey ²	-409	-49.8	-0.55
India ²	-178	-18.8	-0.35	Poland	-380	-73.5	-0.51
Total	-5,829		-11.6	Total	-11,624		-15.6
2. Largest Creditor Economies							
Japan	1,793	41.2	3.56	Japan	3,056	62.4	4.10
Germany	782	26.9	1.55	China ²	1,686	17.8	2.26
Hong Kong SAR	535	276.4	1.06	Germany	1,678	46.2	2.25
Saudi Arabia ²	513	136.4	1.02	Saudi Arabia ²	1,063	142.1	1.43
Taiwan Province of China ³	504	134.0	1.00	Switzerland	939	144.3	1.26
Switzerland	495	122.3	0.98	Taiwan Province of China ³	933	190.9	1.25
China ²	476	17.0	0.94	Hong Kong SAR	767	280.1	1.03
Singapore ²	371	251.0	0.74	Norway ⁴	732	142.8	0.98
United Arab Emirates ²	312	140.4	0.62	Kuwait ²	652	353.0	0.87
Kuwait ²	210	206.7	0.42	Singapore ²	637	213.9	0.85
Total	5,991		11.9	Total	12,144		16.3

Sources: IMF, World Economic Outlook database; External Wealth of Nations Mark II data set (Lane and Milesi-Ferretti 2007); and Lane and Milesi-Ferretti 2012.

¹The External Wealth of Nations Mark II data set (Lane and Milesi-Ferretti 2007) used in this analysis excludes gold holdings from foreign exchange reserves.

²IMF staff estimates for these economies may differ from the international investment position, where reported.

³National sources.

⁴IMF staff estimates for 2013.

ances. What would be required for such a decrease would be a reversal of flows (from deficit to surplus or vice versa) that is sustained: one year of surplus after several years of deficits will typically not suffice. Indeed, there is a strong relationship ($R^2 = 0.73$, and t -statistic of 13.6) between the change in net foreign assets between 2006 and 2013 and the current account balances accumulated during the same period (Figure 4.14). On average (and in most of the top 10 cases), continued current account deficits in debtor economies played the main role in the widening stocks of net foreign liabilities as a percentage of GDP (Table 4.3). Similarly, for creditors, continued current account surpluses explain much of the widening stocks of net foreign assets.

Second, valuation effects can change asset positions independently of flow imbalances. Such changes had some effect on net foreign asset positions between 2006 and 2013, albeit in most cases less than those

from cumulative current account balances or economic growth for the largest debtors and creditors (Table 4.3).²⁴ Notable exceptions were Belgium, Canada, Finland, Greece, South Africa, and the United Kingdom, where valuation changes were the dominant factor behind the improvement in their net foreign asset positions—and in the United Kingdom's case, knocked it out of the largest 10 debtors in 2013 (Table 4.2).

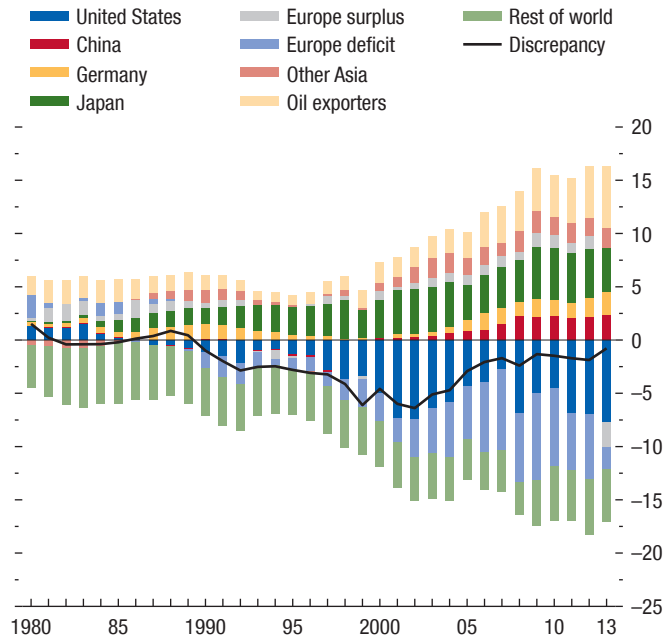
The sources of valuation changes are complex and depend on the country's initial international investment position (creditor or debtor) and the composition of its gross assets and liabilities (fixed income, equity).²⁵ In general, asset prices increased

²⁴See Appendix 4.1.

²⁵A panel regression of 60 economies from 2006 to 2013 suggests that creditor economies made fewer valuation gains (as a share of their initial stock position) compared with debtor economies. At the same time, nominal depreciation in debtor economies appears to have increased valuation gains for these economies (because it

Figure 4.12. Global Net Foreign Assets (“Stock”) Imbalances
(Percent of world GDP)

Stock imbalances continued to grow between 2006 and 2013 despite the narrowing in flow imbalances. This reflects the fact that to reduce the former, a sustained reversal in the latter is needed.



Source: IMF staff calculations.

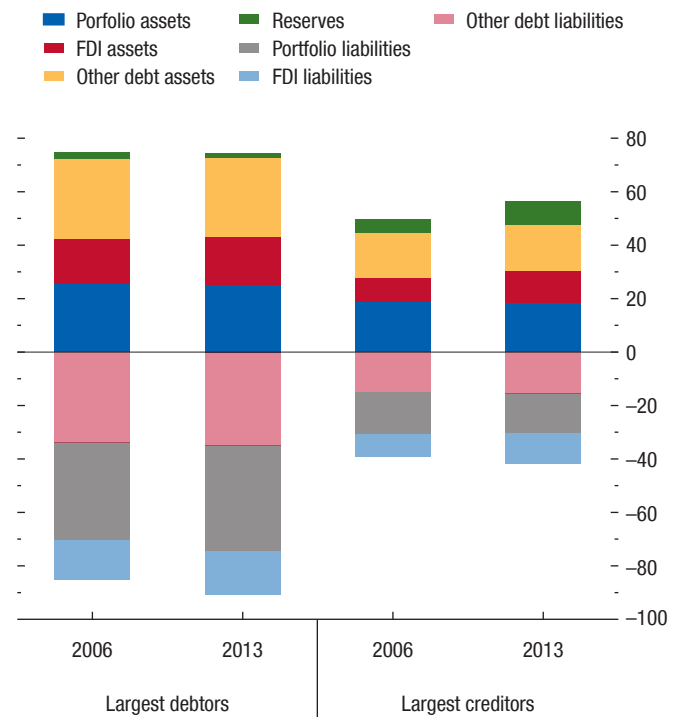
Note: Oil exporters = Algeria, Angola, Azerbaijan, Bahrain, Bolivia, Brunei Darussalam, Chad, Republic of Congo, Ecuador, Equatorial Guinea, Gabon, Iran, Iraq, Kazakhstan, Kuwait, Libya, Nigeria, Norway, Oman, Qatar, Russia, Saudi Arabia, South Sudan, Timor-Leste, Trinidad and Tobago, Turkmenistan, United Arab Emirates, Venezuela, Yemen; Other Asia = Hong Kong SAR, India, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan Province of China, Thailand. European economies (excluding Germany and Norway) are sorted into surplus or deficit each year by the signs (positive or negative, respectively) of their current account balances.

between 2006 and 2013: both equity and bond prices rose with the substantial decline in long-term interest rates, which, all else equal, should benefit net creditors relative to net debtors (and thus widen imbalances). Conversely, the drastic downward revision of economic prospects for most large debtor economies after the global financial crisis lowered the value of assets located in these economies. Although this implies a negative wealth effect for a particular country, it also means a

reduced the value of their liabilities, namely, the assets located in the country), which could have helped stabilize their net foreign asset positions. Although these variables are statistically significant in the panel regression, year-by-year cross-sectional regressions yield no systematic relationship between them. Data on the currency composition of external balance sheets are limited and hence are not examined.

Figure 4.13. Gross Foreign Assets and Liabilities
(Percent of world GDP)

Gross assets and liabilities of the largest debtors and creditors continued to expand between 2006 and 2013, with no reversal in the trend of international financial integration following the global financial crisis.



Sources: External Wealth of Nations Mark II data set (Lane and Milesi-Ferretti 2007); and Lane and Milesi-Ferretti 2012.

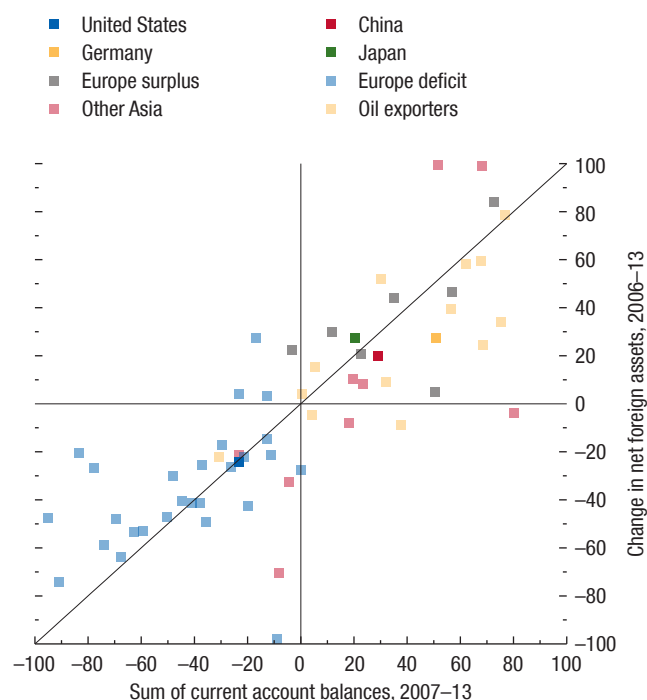
Note: FDI = foreign direct investment. Portfolio is both equity and debt portfolio stocks, and other debt is financial derivatives and other (including bank) investments.

lower value of its foreign liabilities, implying a capital gain. The United States was unique in this regard: despite the country being a major debtor and having experienced a large downward revision in its growth prospects, the value of U.S. assets rose because of safe haven concerns, implying a capital loss on its international investment position.

Third, growth effects can also lead to higher imbalances as a share of GDP, as in the case of public debt (Table 4.3). Economic growth was also important, with the effects up to roughly one-third the size of those from cumulative current account balances, and with the opposite sign. For creditor economies, GDP growing ahead of net foreign assets lowered net foreign asset ratios, whereas in debtor economies, this contributed to lower net foreign liability ratios. In euro area debtor economies, however,

Figure 4.14. Adjustment in Net Foreign Assets versus Current Account Balance
(Percent of average GDP)

Current account balances were typically the main driver of changes in net foreign asset positions between 2006 and 2013 with R^2 of 0.73, as suggested by the closely clustered observations around the diagonal.



Source: IMF staff calculations.

Note: Europe deficit = Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, France, Greece, Hungary, Ireland, Italy, Kosovo, Latvia, Lithuania, FYR Macedonia, Moldova, Poland, Portugal, Romania, Serbia, Slovak Republic, Slovenia, Spain, Turkey, Ukraine, United Kingdom; Europe surplus = Austria, Belgium, Denmark, Finland, Netherlands, Sweden, Switzerland; Oil exporters = Algeria, Angola, Bahrain, Ecuador, Iran, Kazakhstan, Nigeria, Oman, Russia, Turkmenistan, United Arab Emirates, Uzbekistan, Yemen; Other Asia = Hong Kong SAR, India, Indonesia, Korea, Malaysia, Philippines, Taiwan Province of China, Thailand, Vietnam. Europe deficit and surplus economies are sorted based on the signs of their average current account balances between 2004 and 2006.

the persistence of stock imbalances reflected the deep contraction in some of these economies. Growth and the strength of the external flow adjustment will likely be the main forces determining the future direction of stock imbalances; valuation effects might help, but they cannot be relied on.

Looking Ahead: How Will Global Imbalances Evolve?

Where are global imbalances headed? The preceding discussion suggests that flow imbalances have nar-

rowed, and the closing of output gaps should not in itself reverse much of the narrowing. But output gaps are only part of what drives current account dynamics: policy choices and other economic forces might lead to a renewed widening or further shrinking of flow imbalances. Projections underlying the WEO point to the latter: if these projections are realized, flow imbalances will decline from a total (deficit plus surplus) of 3.3 percent of world GDP in 2013 to less than 3.0 percent of world GDP by 2019 (Figure 4.15).²⁶ Although that is not a dramatic further narrowing of flow imbalances, they are at least not projected to grow.

The current account imbalance of the United States, the largest on the deficit side, is projected to remain roughly constant at about 0.60 percent of world GDP, as the effect of domestic demand growth offsets the improving energy trade balance. The negative balance of deficit economies in the European Union (EU) (“Europe deficit” in the figure) is projected to shrink marginally, from 0.20 percent of world GDP in 2013 to 0.14 percent of world GDP by 2019. On the surplus side, through 2019, oil exporters are projected to halve their imbalances from 0.70 percent of world GDP to 0.31 percent of world GDP, whereas China and other parts of Asia (“Other Asia” in the figure) are projected to widen their surpluses from 0.50 percent to 0.70 percent of world GDP. Germany and the other EU surplus economies (“Europe surplus” in the figure) together are projected to shrink their surpluses from 0.70 percent to 0.54 percent of world GDP.

In contrast, stock imbalances are projected to grow from about 40 percent of world GDP in 2013 to about 45 percent of world GDP by 2019 (Figure 4.16).²⁷ The net foreign asset position of China, the second-largest creditor, is projected to rise from 2.3 percent of world GDP in 2013 to 3.4 percent of world GDP by 2019, whereas the net foreign liabilities of the United States, the largest debtor, are projected to rise from 7.6 percent of world GDP to 8.5 percent of world GDP during that period. Several other economies that have large debtor positions as a share of their own GDP and that make the top 10 list globally in 2006 or 2013 (or both) are projected to stabilize or improve their international investment positions.

²⁶These projections assume that output gaps are approximately closed by the end of the projection horizon (2019).

²⁷These projections assume that the real effective exchange rate will be constant, and that there are no valuation effects.

Table 4.3. Decomposition of Changes in Net Foreign Assets between 2006 and 2013¹
(Percent of GDP)

Country	Largest Debtor Economies, 2013				Country	Largest Creditor Economies, 2013			
	Current Account, 2007–13	Valuation, 2007–13	Growth Adjustment, 2007–13	Change in Net Foreign Assets ²		Current Account, 2007–13	Valuation, 2007–13	Growth Adjustment, 2007–13	Change in Net Foreign Assets ²
United States	-21.2	-2.4	2.5	-19.7	Japan	18.9	1.0	2.5	24.7
Spain	-34.3	-6.7	2.4	-33.7	China ³	20.9	-7.4	-10.4	0.8
Brazil ³	-11.3	-9.6	16.1	-4.8	Germany	42.5	-25.1	-4.0	19.2
Italy	-11.8	1.3	1.0	-11.6	Saudi Arabia ³	102.8	3.3	-67.7	5.9
Australia	-25.4	9.2	18.8	2.9	Switzerland	63.4	-21.8	-18.6	21.3
France	-10.0	-11.3	0.2	-18.7	Taiwan Province of China ⁴	62.8	18.6	-21.4	57.8
India ³	-14.4	-4.6	11.4	-7.4	Hong Kong SAR	44.1	39.4	-81.0	3.3
Mexico ³	-7.6	0.8	12.3	-0.4	Norway ⁵	80.0	34.9	-16.4	88.3
Turkey ³	-33.7	-5.6	19.8	-17.4	Kuwait	209.6	18.0	-87.7	147.0
Poland	-27.0	-14.0	16.2	-24.2	Singapore	118.8	-57.7	-90.1	-28.2
Weighted Average ⁶	-19.1	-3.4	5.5	-16.0	Weighted Average ⁶	34.1	-6.8	-11.7	14.6

Sources: External Wealth of Nations Mark II data set (Lane and Milesi-Ferretti 2007); IMF, World Economic Outlook database; Lane and Milesi-Ferretti 2012; and IMF staff calculations.

¹The *World Economic Outlook* reports balance of payments data using the methodology of the sixth edition of the *Balance of Payments and International Investment Position Manual* (BPM6). For those national authorities still reporting data in BPM5, a generic conversion is employed. Hence, data for those countries are subject to change upon full adoption of the BPM6.

²A country's decomposition (cumulative current account, valuation, and growth adjustment) may not add up exactly to the change in net foreign assets, as cumulative capital account flows and errors and omissions are not shown. See Appendix 4.1.

³IMF staff estimates for these economies may differ from the international investment position, where reported.

⁴National sources.

⁵IMF staff estimates for 2013.

⁶Calculated using 2013 market shares.

To explore the expected dynamics of stock imbalances further, panel 1 of Figure 4.17 plots current account balances in 2013 against net foreign asset positions in 2013. For creditor economies, the relationship is upward sloping; economies with higher net foreign asset positions in 2013 ran larger current account surpluses. The relationship for debtor economies is instead negative, indicating that the more indebted the economy, the smaller its current account deficit or the larger its current account surplus. Moreover, for many debtor economies, the projected average current account balance for the next five years exceeds the balance that would be required to stabilize the ratio of net foreign assets to GDP, so these economies' net liability positions will decline (Figure 4.17, panel 2).²⁸

Determining the point at which deficits or debtor positions become substantially more vulnerable is difficult, because many factors are typically at play in a crisis. Statistical analysis of past crises (banking, currency, sovereign debt, and sudden stops) suggests thresholds of 6 percent of GDP for the current account deficit and

60 percent of GDP for the net foreign liability position as points at which vulnerability to crisis is heightened in advanced economies.²⁹ Corresponding thresholds based on a sample of emerging market economies are 3 percent of GDP for the current account deficit and 40 percent of GDP for the net foreign liability position.³⁰ It bears emphasizing that these thresholds are purely indicative, with large type I (false negative) and type II (false positive) errors. For instance, among advanced economies, the likelihood of experiencing some form of crisis when the current account deficit exceeds 6 percent of GDP is 13 percent—almost double the 7 percent crisis probability when the deficit is below that threshold. But another way of stating the same

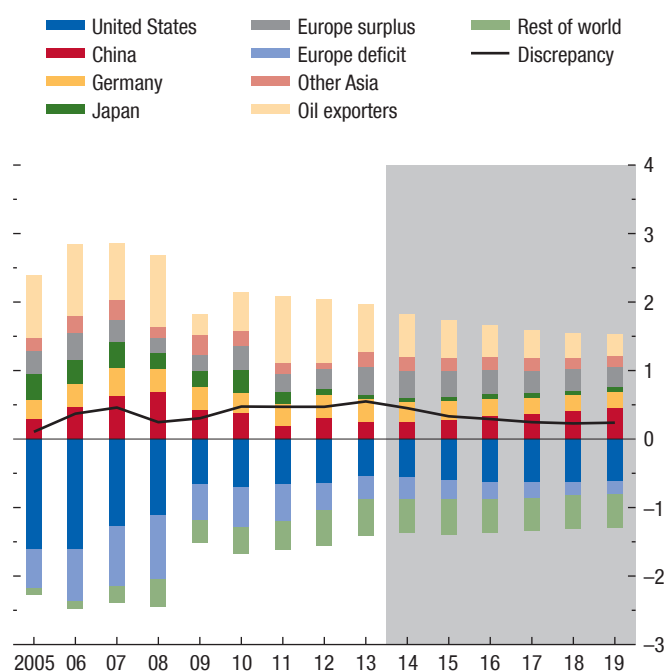
²⁹The threshold is determined by calculating the value that minimizes the sum of the percentage of type I (false negative) and type II (false positive) errors for each type of crisis; the resulting threshold values are averaged, using as weights the goodness of fit (1 minus the sum of type I and type II errors); see Appendix 4.5.

³⁰These estimated thresholds are similar to those obtained in the literature. Using 26 episodes of adjustment from a sample range of 1980–2003, Freund and Warnock (2005) calculate an average current account trough of 5.6 percent of GDP, after which a deficit economy has experienced reversals. Catão and Milesi-Ferretti (2013) study the extent to which net foreign liabilities help predict an external crisis. They find that net foreign liabilities are a significant predictor of a crisis (even if the current account balance is controlled for), particularly when they exceed 50 percent of GDP.

²⁸The current account balance that stabilizes net foreign assets is calculated as $ca^* = g \times nfa$, where ca^* is the current account balance that stabilizes net foreign assets as a percentage of GDP, g is the (projected) growth rate of the U.S. dollar value of GDP, and nfa is the initial net foreign asset position as a percentage of GDP.

Figure 4.15. Global Current Account Imbalances
(Percent of world GDP)

The WEO projects global current account balances to narrow slightly over the medium term. The WEO projections typically assume output gaps that close over the next five years and constant real effective exchange rates.



Source: IMF staff estimates.

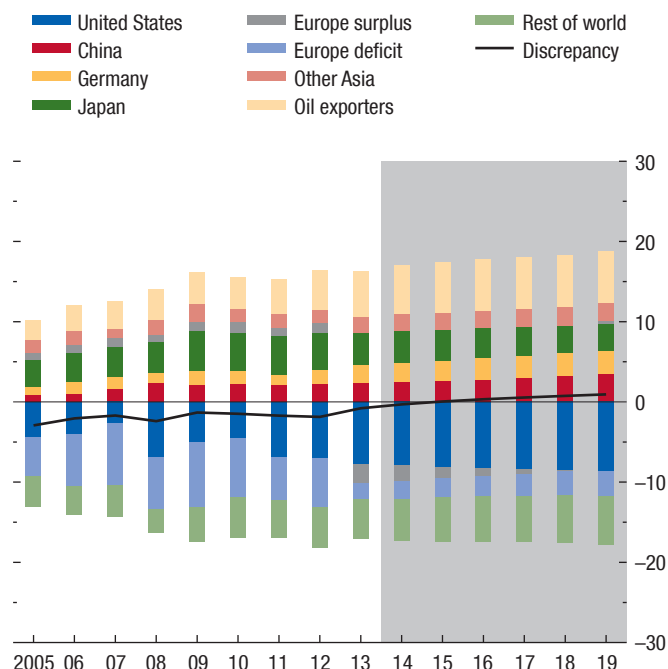
Note: Oil exporters = Algeria, Angola, Azerbaijan, Bahrain, Bolivia, Brunei Darussalam, Chad, Republic of Congo, Ecuador, Equatorial Guinea, Gabon, Iran, Iraq, Kazakhstan, Kuwait, Libya, Nigeria, Norway, Oman, Qatar, Russia, Saudi Arabia, South Sudan, Timor-Leste, Trinidad and Tobago, Turkmenistan, United Arab Emirates, Venezuela, Yemen; Other Asia = Hong Kong SAR, India, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan Province of China, Thailand. European economies (excluding Germany and Norway) are sorted into surplus or deficit each year by the signs (positive or negative, respectively) of their current account balances.

result is that there is an 87 percent probability of *not* experiencing a crisis, even when the current account deficit exceeds the threshold.

With these caveats in mind, Figure 4.18 plots the evolution of the current account and net foreign asset positions of the economies on the 2006, 2013, or (projected) 2019 top flow or stock imbalances lists, together with the indicative thresholds. Whereas several economies are below or close to either or both of these thresholds in 2006, a handful are in 2013 or are expected to be in 2019. In general, the most vulnerable economies move by 2019 toward the upper right quadrant in panel 3 of the figure, which indicates diminishing vulnerability to a sudden stop or external crisis.

Figure 4.16. Global Net Foreign Asset Imbalances
(Percent of world GDP)

Global stock imbalances are projected to widen further over the medium term, reflecting the continued (albeit narrowing) flow imbalances.



Source: IMF staff estimates.

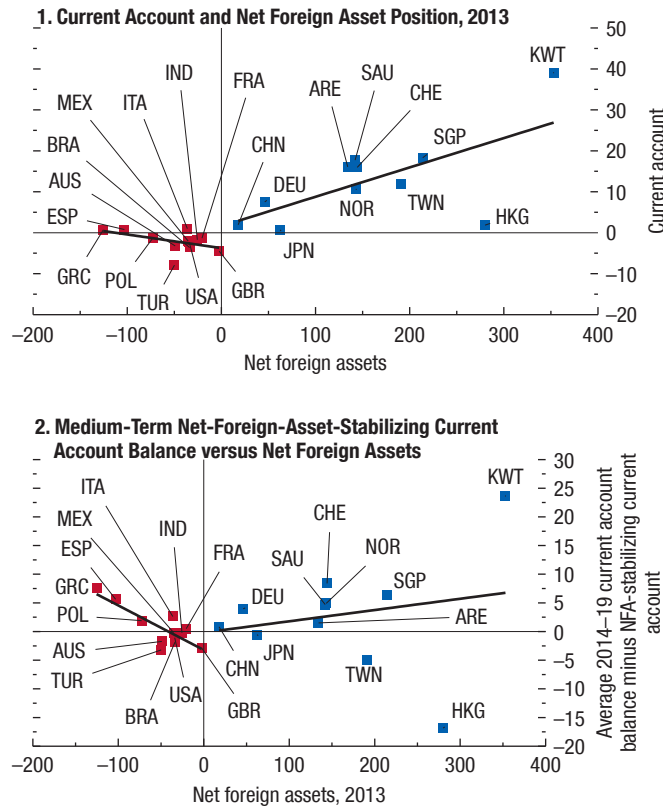
Note: Oil exporters = Algeria, Angola, Azerbaijan, Bahrain, Bolivia, Brunei Darussalam, Chad, Republic of Congo, Ecuador, Equatorial Guinea, Gabon, Iran, Iraq, Kazakhstan, Kuwait, Libya, Nigeria, Norway, Oman, Qatar, Russia, Saudi Arabia, South Sudan, Timor-Leste, Trinidad and Tobago, Turkmenistan, United Arab Emirates, Venezuela, Yemen; Other Asia = Hong Kong SAR, India, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan Province of China, Thailand. European economies (excluding Germany and Norway) are sorted into surplus or deficit each year by the signs (positive or negative, respectively) of their current account balances.

Some of these economies, including a few major emerging market economies, nevertheless remain vulnerable to shifts in market sentiment or to sudden increases in world interest rates (which would, over time, worsen the dynamics of their net liability positions), for instance, as monetary policy in advanced economies is normalized.³¹ Loss of financing would of course narrow the imbalances, but the adjustment would be too abrupt, entailing high economic and social costs. Beyond the systemically large debtors, moreover, several smaller European economies, as well

³¹ See Chapter 1 of the October 2014 *Global Financial Stability Report*.

Figure 4.17. Determining Net Foreign Asset Sustainability
(Percent of GDP)

For creditor economies there is a positive association between current account balances and net foreign asset (NFA) positions both in the short and medium term. In contrast, for debtor economies the association between current account balances and NFAs is negative, indicating that the more indebted the economy, the smaller its current account deficit (or the larger its surplus).



Source: IMF staff calculations.

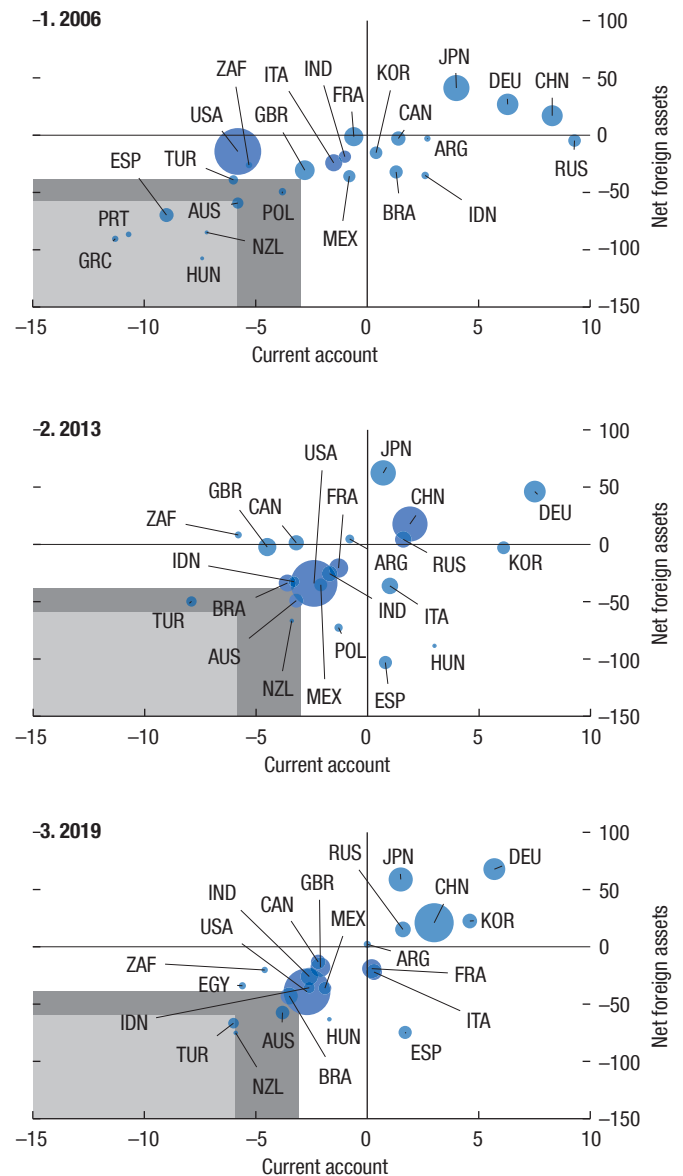
Note: Red data points are largest debtor economies, 2006 and 2013; blue data points are largest creditor economies, 2006 and 2013. Data labels in the figure use International Organization for Standardization country codes.

as some frontier markets among developing economies, remain vulnerable in the medium term, requiring substantial improvements in their net-exports-to-GDP ratios. While the deficits and debtor positions of these economies do not account for a significant proportion of global imbalances, experience during the global financial crisis has underscored that crises even in small economies may have wider repercussions due to upstream and downstream financial linkages.

Among the major debtors, the key exception to the trend of diminishing vulnerability is the unique case of the United States, whose net foreign liability position is projected to deteriorate from 4 percent of world GDP

Figure 4.18. Largest Deficit/Debtor Economies: Current Account versus Net Foreign Assets, 2006, 2013, and 2019
(Percent of GDP)

In 2006, the current account balance and net foreign asset positions of several economies were close or exceeded the thresholds associated with past crises (banking, currency, sovereign debt, and sudden stops). In 2013 and 2019 only a handful of these economies exceeded or are projected to exceed the crisis thresholds. This indicates that the vulnerability of these economies to crisis has diminished.



Source: IMF staff calculations.

Note: Size of bubble is proportional to the share of world GDP. Data labels in the figure use International Organization for Standardization country codes. Shaded areas represent vulnerability thresholds for advanced economies (light gray) and emerging market and developing economies (dark gray and light gray together); see Appendix 4.5.

in 2006 to 8.5 percent of world GDP in 2019. Indeed, one of the concerns with growing global imbalances in the mid-2000s was the (admittedly remote) possibility of the U.S. liability position suddenly reaching a tipping point, after which private and public holders of U.S. assets would lose confidence, and the U.S. dollar would lose its reserve currency status.

The U.S. net liability position in fact worsened to almost 8 percent of world GDP in 2013, but for a number of reasons, the likelihood that the dollar will lose its reserve currency status seems substantially lower than it did eight years ago. First, projected flow deficits of the United States are now considerably smaller than they were in 2006. Second, the U.S. dollar continues to be the leading transaction currency in foreign exchange markets and a key invoicing currency in international trade. It accounts for a dominant share of all outstanding debt securities issued anywhere in the world and especially of those securities sold outside the issuing country in a currency other than that of the issuer (Goldberg 2010). Third, dollar assets held in central bank reserves are not excessive in relation to central banks' "optimal" currency portfolios.³² Fourth, at present, the dollar has relatively few competitors, since being a reserve currency requires that a substantial stock of assets be denominated in that currency. Fifth, and perhaps most telling, during the global financial crisis—whose epicenter was the United States—investors rushed for the safety of the U.S. dollar.³³

Conclusion

Global current account imbalances have narrowed substantially since their precrisis peaks in 2006, and their configuration changed markedly along the way. As a proportion of world GDP, the United States' large

current account deficit has been more than halved, and the euro area deficit economies have moved into surplus. The surpluses in China and Japan, the two main counterparts to the 2006 U.S. deficit, have decreased markedly as well. Moreover, a few advanced economy commodity exporters and some major emerging market economies that previously had surpluses have now switched to deficits, contributing to smaller imbalances, but also, in some cases, contributing to new vulnerabilities.

With the shrinkage in large deficits, the systemic risks from flow imbalances surely decreased. The IMF's most recent *Pilot External Sector Report* (IMF 2014) still finds that many larger economies' flow imbalances are excessive relative to levels consistent with fundamentals and appropriate policy settings, but the current account imbalances have nevertheless narrowed, in some cases considerably, from their 2006 levels. Likewise, the current account gaps related to new deficits remain relatively small. Although many large current account deficits remain in economies other than the largest ones, the related reversal risks are likely to be country specific, not systemic.

Much of the adjustment in flow imbalances has been driven by lowered demand in deficit economies after the global financial crisis and by growth differentials related to the faster recovery of emerging market economies and commodity exporters after the Great Recession. Expenditure switching (from imports to domestic goods and services or vice versa) has, in general, played less of a role throughout the recent adjustment period, especially in economies that have faced significant slack and operate under fixed-exchange-rate regimes. But such expenditure switching has risen among the largest deficit and surplus economies, as it did in earlier episodes of narrowing global imbalances.

The significant role of weaker demand and growth differentials in the narrowing of global flow imbalances has been associated in many economies with high costs in the form of increased internal imbalances. However, the weaker demand has also allowed substantial current account adjustment without the disruptive exchange rate corrections—most notably of the U.S. dollar—that some feared were in the offing before the global financial crisis. In the process, some of the asset price bubbles and credit booms that underlay the large imbalances in many advanced economies up to about 2006 have also been corrected, although others may have since emerged, including as a result of the response to the crisis.

³²Optimal currency composition of reserve portfolios is calculated under the assumption that the objective is to preserve the "real" value of reserves. A natural choice of deflator in this context is the import deflator, because the ultimate purpose of holding reserves is to enable net imports. Such an exercise yields a global optimal currency portfolio for reserves in which the dollar accounts for roughly 60 percent of the value (regardless of whether individual economies' optimal portfolios are weighted by imports or by reserve holdings); that level approximately matches the reported share in the IMF's Currency Composition of Official Foreign Exchange Reserves database for 2013; see Ghosh, Ostry, and Tsangarides 2011 for details of this calculation.

³³See, for instance, Ghosh, Ostry, and Tsangarides 2011, Prasad 2014, and Schenk 2013 on historical precedents of global switches in reserve currencies.

The widening of internal imbalances while external imbalances narrowed has led, however, to concerns that, without further expenditure switching, external imbalances could widen again once output gaps close. Indeed, as output gaps in several advanced economies widened in 2013, global imbalances narrowed further. In advanced economies, much will depend on whether the lowering of their output since the global financial crisis has been mostly structural or mostly cyclical. If structural—the case incorporated in WEO baseline forecasts—much of the narrowing in global flow imbalances will be lasting.

But in some advanced economies with current account deficits, notably those in the euro area, output gaps are most likely large, and more expenditure switching would help these economies boost growth while maintaining narrower external imbalances. Against this backdrop, the uneven contribution of surplus economies to the narrowing of global imbalances remains a concern. The imbalances remain large among European surplus economies and oil exporters.

The nature and intensity of the policy measures needed to address remaining external imbalances and to contain emerging imbalances vary across economies and country groups. For instance, deficit economies need to take actions to advance fiscal consolidation and introduce structural reforms to facilitate external adjustment (including those to raise saving, make labor markets more flexible, and remove supply bottlenecks). In some emerging market economies with increasing deficits, measures to rein in private demand may be needed, including macroprudential measures to restrain credit booms and asset price bubbles. Surplus economies, in contrast, need to take steps to rebalance growth—including, in some cases, by raising public sector investment (see Chapter 3). In some other cases, adoption of more market-based exchange rates, reduction of capital account restrictions, strengthening of social safety nets, and implementation of financial sector reforms might also be required. As historical precedents and theory suggest, greater coordination of economic policies between, and among, surplus and deficit economies will make it easier to achieve these goals individually and collectively (see Ostry and Ghosh 2013).

Although concerns about global flow imbalances may have lessened since 2006, problems remain with respect to net external positions or stock imbalances. As a percentage of GDP, these metrics have generally widened further since most economies continue to

be either net lenders or net borrowers, with current account imbalances typically only narrowing rather than reversing. Output declines or low output growth, together with low inflation, are another reason why net external liabilities have remained high as a share of GDP. Some large debtor economies thus remain vulnerable to changes in market sentiment and hence represent continued possible systemic risks. However, the liability position of the United States, the largest debtor globally, in relation to its own GDP remains relatively low, and the behavior of investors during the global financial crisis is a testament to their continued confidence in dollar assets.

Containing stock imbalances in debtor economies ultimately requires improvements in current account balances and stronger growth; increased resilience will also depend on the structure of assets and liabilities. Policy measures to achieve both stronger and more balanced growth in the major economies would help in this respect, including in large surplus economies with available policy space. Such measures would also help further reduce global imbalances.

Appendix 4.1. Data Definitions, Sources, and Descriptions

The primary sources for this chapter are the IMF's *Balance of Payments Statistics* (BOPS), *Direction of Trade Statistics* (DOTS), *International Financial Statistics* (IFS), World Economic Outlook (WEO) database, and Global Data Source (GDS); the World Bank's *World Development Indicators*; and the updated and extended version of the External Wealth of Nations (EWN) data set, constructed by Lane and Milesi-Ferretti (2007). Data for all variables (shown in Table 4.4 along with their data sources) are collected on an annual basis from 1970 to 2013, where available.

The main variables, including current account balance, net foreign asset position, trade balance, exports, imports, savings, and investment, are reported as percentages of nominal GDP. Weights used to construct country group aggregates are based on nominal GDP (market-value-based) weights. In addition, real variables, including domestic demand, exports, imports, and GDP, are constructed as percentage changes (log differences).

Precrisis trends are obtained from data in previous WEO reports, such as the September 2006 WEO database, and are constructed using a linear trend for a

Table 4.4. Data Sources

Variable	Sources ¹
Capital Account	IMF, Balance of Payments and International Investment Position Statistics Database.
Consumer Price Index (CPI) Inflation	IMF, World Economic Outlook Database.
Current Account	IMF, Balance of Payments and International Investment Position Statistics Database.
Financial Account	IMF, Balance of Payments and International Investment Position Statistics Database.
Financial Derivative Assets	External Wealth of Nations Database Mark II data set (Lane and Milesi-Ferretti 2007); Lane and Milesi-Ferretti 2012.
Financial Derivative Liabilities	External Wealth of Nations Database Mark II data set (Lane and Milesi-Ferretti 2007); Lane and Milesi-Ferretti 2012.
Foreign Direct Investment Assets	External Wealth of Nations Database Mark II data set (Lane and Milesi-Ferretti 2007); Lane and Milesi-Ferretti 2012.
Foreign Direct Investment Liabilities	External Wealth of Nations Database Mark II data set (Lane and Milesi-Ferretti 2007); Lane and Milesi-Ferretti 2012.
Net Foreign Assets	External Wealth of Nations Database Mark II data set (Lane and Milesi-Ferretti 2007); Lane and Milesi-Ferretti 2012.
Nominal Exchange Rate versus U.S. Dollar, End-of-Period	International Financial Statistics Database.
Nominal Exchange Rate versus U.S. Dollar, Period Average	International Financial Statistics Database.
Nominal Exports in U.S. Dollars	IMF, Balance of Payments and International Investment Position Statistics Database; and IMF, World Economic Outlook Database.
Nominal GDP (Local Currency and U.S. Dollars)	IMF, World Economic Outlook Database.
Nominal Imports in U.S. Dollars	IMF, World Economic Outlook Database.
Other Debt Assets	External Wealth of Nations Database Mark II data set (Lane and Milesi-Ferretti 2007); Lane and Milesi-Ferretti 2012.
Other Debt Liabilities	External Wealth of Nations Database Mark II data set (Lane and Milesi-Ferretti 2007); Lane and Milesi-Ferretti 2012.
Portfolio Equity Assets	External Wealth of Nations Database Mark II data set (Lane and Milesi-Ferretti 2007); Lane and Milesi-Ferretti 2012.
Portfolio Equity Liabilities	External Wealth of Nations Database Mark II data set (Lane and Milesi-Ferretti 2007); Lane and Milesi-Ferretti 2012.
Real Domestic Demand Growth	IMF, World Economic Outlook Database and IMF Staff Calculations.
Real Domestic Demand Growth, Trading Partners	IMF, World Economic Outlook Database; IMF, Information Notice System Weights; and IMF Staff Calculations.
Real Effective Exchange Rate (CPI based)	IMF, International Financial Statistics; and IMF Staff Calculations.
Real Exports	IMF, World Economic Outlook Database.
Real GDP	IMF, World Economic Outlook Database.
Real GDP Growth	IMF, World Economic Outlook Database and IMF Staff Calculations.
Real Imports	IMF, World Economic Outlook Database.
Reserve Assets Excluding Gold	External Wealth of Nations Database Mark II data set (Lane and Milesi-Ferretti 2007); Lane and Milesi-Ferretti 2012.
Terms of Trade	IMF, World Economic Outlook Database.

Source: IMF staff compilation.

¹Not all countries have converted to the sixth edition of the *Balance of Payments and International Investment Position Manual* (BPM6). Data are subject to change once fully converted. Please refer to Table G of the Statistical Appendix for the list of countries that still use the BPM5.

seven-year period that ends three years earlier, such as, for example, the 1996–2003 period for 2006.

The economies included in Tables 4.1 and 4.2 are identified using current account balances and net foreign asset data from the BOPS database and EWN data set. Given the focus of the chapter, the rankings in these tables allow the identification of economies with imbalances with potentially systemic implications.

- *Largest current account deficits and surpluses.* These economies are identified by ranking the WEO database's full list of economies by the dollar size of their current account balances. The top 10 surplus and deficit economies are then selected.
- *Largest net foreign asset (creditors) and liabilities (debtors) positions.* Economies are selected from available data by the dollar size of their positive (creditors) or negative (debtors) net foreign asset positions.

Saving and Investment

The current account balance (CA) is equal to national savings (S) minus investment (I). As the data for savings are the least reliable, values for that variable are derived from the other two using the following identity:

$$S = CA + I, \quad (4.1)$$

in which each variable is expressed as a percentage of GDP. The current account data are obtained from BOPS, and investment is obtained from WEO national accounts data.

Decomposing the Change in Net Foreign Assets

The change in a country's net foreign asset position is defined as follows:

$$NFA_t - NFA_{t-1} \equiv CA_t + KA_t + EO_t + X_t, \quad (4.2)$$

in which CA is the current account—which is the sum of net exports of goods and services, current transfers, and investment income; KA is capital transfers; EO is errors and omissions; and X is net capital valuation gains (losses if negative) from shifts in exchange rates and asset prices.

Thus, the relationship between external flows and stocks can be rewritten as follows (Lane and Milesi-Ferretti 2014):

$$NFA_t \equiv NFA_{t-1} - FA_t + X_t, \quad (4.3)$$

in which FA_t is the financial account balance, that is, $FA_t = -(CA_t + KA_t + EO_t)$; and X_t is the valuation effect.

Hence, to calculate the cumulative valuation effects during 2006–13 as presented in Table 4.3, one can use the following equation:

$$\sum_{t=2007}^{2013} X_t = NFA_{2013} - NFA_{2006} + \sum_{t=2007}^{2013} FA_t. \quad (4.4)$$

These variables are in levels and calculated in local currency using period-average exchange rates for flows and end-of-period exchange rates for stocks. Recursive iteration and substitution in equation (4.2) shows two of the main components of the net foreign asset position—the cumulative current account and the cumulative valuation effect:

$$NFA_t = \sum_{s=0}^{q-1} CA_{t-s} + \sum_{s=0}^{q-1} (KA_{t-s} + EO_{t-s}) + \sum_{s=0}^{q-1} X_{t-s} + NFA_{t-q}. \quad (4.5)$$

However, a better proxy for a country's stock imbalance is the ratio of its net foreign asset position to GDP, which controls for the size of the economy. In this case, equation (4.5) can be written as follows:

$$nfa_t - nfa_{t-q} = \frac{(\sum_{s=0}^{q-1} CA_{t-s})}{Y_t} + \frac{(\sum_{s=0}^{q-1} (KA_{t-s} + EO_{t-s}))}{Y_t} + \frac{(\sum_{s=0}^{q-1} X_{t-s})}{Y_t} - \frac{g_{y,t-q}}{1 + g_{y,t-q}} nfa_{t-q}, \quad (4.6)$$

in which lowercase letters denote variables as a ratio to GDP. The final term on the equation's right-hand side captures the adjustment due to nominal GDP growth, in which $g_{y,t-q}$ is the nominal GDP growth between $t - q$ and t , and $q \geq 1$.

Appendix 4.2. Panel Estimations

A country's current account balance is determined by a number of factors, both domestic and foreign, summarized in the following relationship:

$$CA = f(DD, DD^*, \epsilon, \tau). \quad (4.7)$$

The current account (as a share of GDP), CA , is a function of real domestic demand, DD ; real domestic demand in trading partner economies, DD^* ; the real effective exchange rate, ϵ ; and the terms of trade, τ . Taking the total derivative yields the relationship to be estimated:

$$dCA = \frac{\partial CA}{\partial DD} dDD + \frac{\partial CA}{\partial DD^*} dDD^* + \frac{\partial CA}{\partial \epsilon} d\epsilon + \frac{\partial CA}{\partial \tau} d\tau. \quad (4.8)$$

Economic theory gives us an idea of the sign of these effects in advance:³⁴

$$\frac{\partial CA}{\partial DD} < 0; \frac{\partial CA}{\partial DD^*} > 0; \frac{\partial CA}{\partial \epsilon} < 0; \frac{\partial CA}{\partial \tau} > 0. \quad (4.9)$$

Given the chapter's global focus, panel data techniques are applied to test equation (4.8) and establish the relative importance of expenditure changing and expenditure switching during current account adjustment periods. Because current account balances are the outcome of intertemporal decisions taken jointly

³⁴The negative relationship between the change in the real effective exchange rate and the change in the current account as a percentage of GDP assumes that the Marshall-Lerner condition is satisfied, that is, that the sum of the elasticities of exports and imports with respect to the real exchange rate exceeds unity.

Table 4.5. Sample Economies

Europe		Asia	
Austria	Netherlands	Australia	Malaysia
Belgium	Norway*	China	Morocco
Bulgaria	Poland	Hong Kong SAR	New Zealand
Croatia	Portugal	India	Pakistan
Czech Republic	Romania	Indonesia	Philippines
Denmark	Russia*	Ireland	Singapore
Estonia	Serbia	Israel	Sri Lanka
Finland	Slovak Republic	Japan	Taiwan Province of China
France	Slovenia	Korea	Thailand
Germany	Spain	Americas	
Greece	Sweden	Argentina	El Salvador
Hungary	Switzerland	Brazil	Guatemala
Iceland	Turkey	Canada	Mexico
Italy	Ukraine	Chile	Peru
Latvia	United Kingdom	Colombia	United States
Lithuania		Costa Rica	Uruguay
Africa		Dominican Republic	
South Africa	Tunisia		

Source: IMF staff compilation.

* Oil exporters.

by multiple agents globally, pooling information in a panel regression allows a richer set of dynamics to be captured over time and across economies.

This relationship is specified econometrically as follows:

$$\Delta CA_{i,t} = \beta_0 + \beta_1 \Delta DD_{i,t} + \beta_2 \Delta DD^*_{i,t} + \beta_3 \Delta REER_{i,t} + \beta_4 \Delta ToT_{i,t} + u_i + \varepsilon_{i,t}, \quad (4.10)$$

in which for country i , $\Delta CA_{i,t}$ is the year-over-year change in the current account (as a share of GDP); $\Delta DD_{i,t}$ is the annual growth rate of real domestic demand; $\Delta DD^*_{i,t}$ is the weighted average annual real domestic demand growth across country i 's trading partners; $\Delta REER_{i,t}$ is the annual percentage change in the real effective exchange rate; $\Delta ToT_{i,t}$ is the annual growth rate in the terms of trade; u_i captures country-specific fixed effects; and $\varepsilon_{i,t}$ are the idiosyncratic errors.

Fixed-effects panel estimation with robust standard errors is used for the regression for a sample of 64 economies (Table 4.5) using annual data for the period 1970–2013. The panel is unbalanced owing to gaps in the data.

The results for 10 regression estimations are reported in Table 4.6. The first column of the table reports the coefficients from the full regression of the change in current account balances as a share of GDP on the four explanatory variables (regressors)

and their one-period lags as listed in equation (4.10).

The results indicate that over the full sample period, a 1 percentage point increase in the growth rate of domestic demand for one year is associated with a deterioration in the current account balance of slightly more than 0.3 percentage point of GDP over two years. A 1 percentage point increase in trading partner demand growth for one year leads instead to an improvement in the current account by a little more than 0.06 percentage point of GDP over two years. Finally, a 5 percent depreciation in the real effective exchange rate is associated with an improvement in the current account balance of 0.3 percentage point over two years.

The next five columns of the table explore how the explanatory power of the regression (the overall R^2) alters once certain key explanatory variables are excluded. As noted in the chapter text, the omission of the change in the real effective exchange rate (column 4) has little impact on overall explanatory power, but removing growth in aggregate demand (both domestic demand and that of trading partners) leads to a sharp reduction in the model's goodness of fit (from slightly more than 0.4 to 0.1).

Columns (7) through (10) present results from partitioning the data set into two subsets. The first subset looks at the effect of a change in the explanatory variables in the years of adjustment in global imbalances (using binary indicators for the years 1975–

Table 4.6. Panel Regression Results, 1970–2013

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Full Sample			Partitioned Samples						
							Adjustment Years ¹	Nonadjustment Years	Peg ²	Float ²
Real Domestic Demand (YoY change, percent)	-0.37*** (-12.6)		-0.38*** (-13.6)		-0.36*** (-12.8)		-0.42*** (-11.0)	-0.33*** (-10.7)	-0.46*** (-5.80)	-0.34*** (-11.4)
Real Domestic Demand, Trading Partners (YoY change, percent)	0.13** (2.49)		0.15*** (2.83)	-0.32*** (-4.18)	0.12** (2.29)		0.12* (1.83)	0.16*** (2.70)	0.16 (1.48)	0.15** (2.38)
Real Effective Exchange Rate (CPI based, YoY change, percent)	-0.03*** (-2.96)	-0.08*** (-7.66)		-0.07*** (-7.01)	-0.03** (-2.38)		0.01 (0.28)	-0.05*** (-4.16)	-0.04* (-2.04)	-0.04*** (-3.11)
Terms of Trade (YoY change, percent)	0.16*** (7.62)	0.11*** (5.14)	0.15*** (7.40)	0.12*** (5.57)	0.15*** (7.45)		0.16*** (6.24)	0.17*** (6.93)	0.20*** (6.52)	0.15*** (6.12)
Real Domestic Demand ($t-1$) (YoY change, percent)	0.05*** (2.93)		0.04** (2.42)			-0.05** (-2.64)	0.08*** (2.89)	0.04* (1.80)	0.06* (1.74)	0.05** (2.67)
Real Domestic Demand, Trading Partners ($t-1$) (YoY change, percent)	-0.07 (-1.55)		-0.06 (-1.44)	-0.09** (-2.11)		-0.10* (-1.96)	-0.17*** (-2.96)	0.02 (0.28)	-0.07 (-1.49)	-0.07 (-1.31)
Real Effective Exchange Rate ($t-1$), (CPI based, YoY change, percent)	-0.03*** (-3.17)	-0.02** (-2.53)		-0.03*** (-2.95)		-0.02* (-1.79)	-0.03** (-2.35)	-0.02*** (-3.01)	-0.02 (-1.01)	-0.03*** (-3.15)
Terms of Trade ($t-1$), (YoY change, percent)	0.00 (0.28)	-0.03*** (-3.66)	-0.01 (-1.02)	-0.03** (-2.52)		-0.03*** (-3.42)	0.00 (-0.44)	0.01 (0.82)	0.03 (1.42)	-0.01 (-0.92)
R^2 (within)	0.44	0.10	0.42	0.15	0.42	0.03	0.45	0.44	0.54	0.41
R^2 (overall)	0.41	0.10	0.39	0.14	0.38	0.03	0.43	0.42	0.51	0.38
Standard deviation of residuals within groups	0.57	0.28	0.59	0.37	0.62	0.28	0.80	0.66	0.59	0.62
Standard deviation of residuals	2.14	2.70	2.17	2.63	2.18	2.80	2.37	2.03	1.84	2.32
Intraclass correlation	0.07	0.01	0.07	0.02	0.07	0.01	0.10	0.10	0.09	0.07
Number of observations	1,929	1,971	1,936	1,959	1,992	1,929	763	1,229	666	1,326
Number of countries	64	64	64	64	64	64	64	64	22	42

Source: IMF staff estimates.

Note: t -statistics in parentheses. CPI = consumer price index; YoY = year over year.¹Periods of adjustment in global current account imbalances: 1975–79, 1987–91, and 2007–13.²Economies partitioned into those with pegged and floating exchange rate regimes as specified in Ghosh, Ostry, and Tsangarides (2011).* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 4.7. Panel Regression Results, 2007–13

	(1)	(2)	(3)	(4)	(5)
	Full Sample	Sample from 2007 to 2013			
Real Domestic Demand (YoY change, percent)	-0.37*** (-12.6)	-0.45*** (-6.93)		-0.45*** (-6.91)	
Real Domestic Demand, Trading Partners (YoY change, percent)	0.13** (2.49)	0.04 (0.34)		0.05 (0.40)	-0.77*** (-5.19)
Real Effective Exchange Rate (CPI based) (YoY change, percent)	-0.03*** (-2.96)	0.02 (0.83)	-0.05 (-1.38)		0.00 (0.10)
Terms of trade (YoY change, percent)	0.16*** (7.62)	0.10** (2.30)	0.02 (0.35)	0.11** (2.51)	0.04 (0.85)
Real Domestic Demand { <i>t</i> -1} (YoY change, percent)	0.05*** (2.93)	0.06 (1.25)		0.06 (1.27)	
Real Domestic Demand, Trading Partners { <i>t</i> -1} (YoY change, percent)	-0.07 (-1.55)	-0.17** (-2.25)		-0.17** (-2.28)	-0.22*** (-3.43)
Real Effective Exchange Rate { <i>t</i> -1} (CPI based, YoY change, percent)	-0.03*** (-3.17)	0.00 (0.15)	0.04 (0.91)		0.02 (0.64)
Terms of Trade { <i>t</i> -1} (YoY change, percent)	0.00 (0.28)	0.00 (-0.26)	-0.06* (-1.84)	0.00 (-0.24)	-0.02 (-0.98)
<i>R</i> ² (within)	0.44	0.54	0.03	0.54	0.30
<i>R</i> ² (overall)	0.41	0.51	0.02	0.51	0.27
Standard deviation of residuals within groups	0.57	1.21	1.58	1.23	1.44
Standard deviation of residuals	2.14	2.32	3.34	2.32	2.85
Intraclass correlation	0.07	0.21	0.18	0.22	0.20
Number of observations	1,929	320	320	320	320
Number of countries	64	64	64	64	64

Source: IMF staff estimates.

Note: *t*-statistics in parentheses. CPI = consumer price index; YoY = year over year.**p* < 0.10; ***p* < 0.05; ****p* < 0.01.

79, 1987–91, and 2007–13; column 7) compared with remaining years in the sample (column 8). In this case, the negative coefficient on the growth in real domestic demand is larger in the years of adjustment relative to more “normal” periods. In addition, expenditure switching does not appear to have been strongly associated with changes in the current account during the periods of adjustment, unlike in other years. However, it is possible that the strength of expenditure switching is weakened by the more extreme fallout from the global financial crisis and subsequent Great Recession. Columns (9) and (10) show very similar regression results for economies with either pegged or floating exchange rates. In particular, the impact of changes in the real effective exchange rate on the current account is virtually identical, but more precisely estimated in the case of economies with floating exchange rates.

When the relationship is tested for the 1986–91 adjustment period (see Box 4.1), the change in the real effective exchange rate has a statistically significant negative effect on the current account balance; that is, a real depreciation improves a country’s external balance. A simple robustness test, performed by substituting

lagged terms for each explanatory variable, shows that the significance and sign of the effects of the different factors on the change in the current account do not alter substantially for the real effective exchange rate and domestic demand (column 6).

The panel regression is also performed for the recent adjustment period in global imbalances, 2007–13 (Table 4.7). As noted in the chapter text, the impact of domestic demand growth is even stronger between 2007 and 2013 (column 2) than in the full sample (column 1), whereas neither growth in domestic demand in trading partners nor changes in the real effective exchange rate has a statistically significant impact. One factor that may explain the lack of significance of the impact of real effective exchange rate changes is the fact that increases in indirect taxes—which happened in a number of deficit economies—imply an appreciation in the consumer-price-index-based real effective exchange rate used in the regression but no change in underlying competitiveness.

The coefficients from the full regression (column 1 of Table 4.6) are used to calculate a counterfactual

path for the current account balance for the case in which the expenditure-switching channel is turned off. As noted in the chapter text, this exercise suggests that under those circumstances, imbalances would have widened by an additional 0.4 percent of world GDP in 2013.

Appendix 4.3. Distortions, Policies, and Imbalances

The text compares “current account gaps” in 2006 and 2013 as a measure of the degree to which lower distortions and improved policies have contributed to the narrowing of flow imbalances. This appendix provides details of that analysis.

A country’s current account (as a percentage of GDP) may be modeled as depending upon a vector of policies, \mathbf{P} ; a vector of distortions, \mathbf{D} ; a vector of observed fundamentals, \mathbf{F} ; and a vector of unobserved fundamentals, \mathbf{U} :

$$CA = \alpha + \mathbf{P}'\beta + \mathbf{D}'\gamma + \mathbf{F}'\delta + \mathbf{U}'\theta. \quad (4.11)$$

The appropriate current account balance (that is, taking account of multilateral consistency, as well as sustainable and appropriate policies, \mathbf{P}^*)—the current account “norm”—is given by

$$CA^* = \alpha + \mathbf{P}^{*\prime}\beta + \mathbf{F}'\delta + \mathbf{U}'\theta. \quad (4.12)$$

Ideally, the actual current account (equation 4.11) would be compared with its norm (equation 4.12),

$$CA - CA^* = \rho = \alpha + (\mathbf{P} - \mathbf{P}^*)'\beta + \mathbf{D}'\gamma, \quad (4.13)$$

with the difference between them providing a measure of the policy or other distortions that underlie observed current account positions. Moreover, a comparison of ρ over time (for example, ρ_{2013} versus ρ_{2006}) would provide an indication of the extent to which these distortions had diminished or grown.

The norm is not directly observable, however, and instead a regression model of the current account must be employed as a proxy:³⁵

$$\widehat{CA} = \alpha + \mathbf{P}'\beta + \mathbf{F}'\delta. \quad (4.14)$$

The regression residual is

$$CA - \widehat{CA} = \varepsilon = \mathbf{D}'\gamma + \mathbf{U}'\theta. \quad (4.15)$$

³⁵The regression that underlies the IMF’s External Balance Assessment is used for this purpose (see <http://www.imf.org/external/np/res/eba/pdf/080913.pdf>).

As a proxy for δ (the true deviation of the current account from its norm), the regression residual ε suffers from two shortcomings: first, in addition to genuine distortions, it includes unobserved fundamentals (that is, variables that are omitted from the regression); and second, since the regression controls for actual policies, the residual does not capture the effect on the current account of any divergence of actual policies, \mathbf{P} , from their appropriate or desirable values, \mathbf{P}^* .

To the extent that the unobserved fundamentals are relatively constant, the first of these problems is mitigated by comparing the residual over time. Therefore, smaller residuals in 2013 than in 2006 ($|\varepsilon_{2013}| < |\varepsilon_{2006}|$) can be taken as an indication of fewer distortions. To address the second problem, if an estimate of the desirable policy settings is available, a residual inclusive of the policy distortion may be defined:

$$\vartheta = \varepsilon + (\mathbf{P} - \mathbf{P}^*)'\beta = \mathbf{D}'\gamma + \mathbf{U}'\theta + (\mathbf{P} - \mathbf{P}^*)'\beta, \quad (4.16)$$

where again, comparing ϑ over time likely reduces the impact of the omitted variables. The difficulty in implementing this strategy is that, although estimates of \mathbf{P}^* are available for 2013 as part of the EBA and *External Sector Report* (ESR) exercises, corresponding estimates for 2006 are not available. Since the desirable policies are likely to be fairly invariant over time (for instance, the fiscal balance is defined in cyclically adjusted terms), however, it is possible to approximate the 2006 value using its 2013 value and calculate $\vartheta_{2006} = \varepsilon_{2006} + (\mathbf{P}_{2006} - \mathbf{P}_{2013}^*)'\beta$.

Figure 4.11 (panel 1) compares $|\varepsilon_{2013}|$ with $|\varepsilon_{2006}|$ as an indication of how nonpolicy distortions underlying observed current account balances have changed over time, while Figure 4.11 (panel 2) compares $|\mathbf{P}_{2013} - \mathbf{P}_{2013}^*|$ to $|\mathbf{P}_{2006} - \mathbf{P}_{2006}^*|$ as an indication of how all distortions—policy and other—have evolved. It bears emphasizing that neither the regression residuals, ε , nor the policy-gap-inclusive residuals, ϑ , correspond precisely to the ESR gaps. The latter incorporate IMF staff judgment concerning appropriate external balances, taking account of additional information that cannot be readily captured in standard regression analysis. Although in many cases the ESR gaps (which are available only for 2013) are similar to the policy-gap-inclusive residuals, ϑ , for 2013, there are some instances in which there are marked differences due to country-specific factors.³⁶

³⁶Notably Japan (among the economies with large imbalances considered here); for this reason, the residual for Japan is not shown in Figure 4.11.

Table 4.8. Estimated Threshold Values and Associated Classification Errors

Variable	Crisis	Sample	Threshold (percent)	Crises Missed (type I error; percent)	Noncrises Misclassified (type II error; percent)
NFA	Sudden Stops	AE	-20.0	45.7	37.1
NFA	Debt	AE	-81.2	0.0	3.2
NFA	Currency	AE	-39.6	42.9	18.7
NFA	Bank	AE	-1.4	20.0	65.6
NFA	Any	AE	-21.0	52.4	34.8
NFA	Weighted Average	AE	-55.7		
CA	Sudden Stops	AE	-4.5	74.3	15.8
CA	Debt	AE	-9.9	0.0	3.0
CA	Currency	AE	-2.4	0.0	30.2
CA	Bank	AE	-2.4	48.0	31.0
CA	Any	AE	-3.3	60.3	23.1
CA	Weighted Average	AE	-6.0		
NFA	Sudden Stops	EMDE	-36.2	43.8	48.2
NFA	Debt	EMDE	-44.0	50.0	36.9
NFA	Currency	EMDE	-16.9	14.5	78.3
NFA	Bank	EMDE	-77.4	84.3	11.4
NFA	Any	EMDE	-16.7	18.2	78.6
NFA	Weighted Average	EMDE	-38.4		
CA	Sudden Stops	EMDE	-6.6	58.3	20.7
CA	Debt	EMDE	-2.0	13.0	58.3
CA	Currency	EMDE	-2.0	22.8	58.3
CA	Bank	EMDE	0.2	7.8	78.2
CA	Any	EMDE	-2.0	26.6	58.2
CA	Weighted Average	EMDE	-2.7		

Source: IMF staff estimates.

Note: AE = advanced economies; CA = current account; EMDE = emerging and developing economies; NFA = net foreign assets.

Appendix 4.4. Counterfactual Output Gap Analysis

One of the key questions tackled in the chapter is whether the unwinding of global current account imbalances will prove durable. This question is examined by looking at cyclically adjusted current account balances. To the extent that the relatively narrow imbalances now can be attributed to the difference in cyclical positions or to global excess capacity, a bounce back can be expected in the medium term as output gaps close.

However, there is no universally accepted methodology for assessing how cyclical conditions affect current account balances. To get an idea of magnitudes, a simple, parsimonious approach based on the IMF's EBA methodology is employed.³⁷ The cyclical component of the ratio of the current account to GDP for a given country is computed as the difference between its output gap and the world output gap multiplied by a factor (-0.4) recovered from the EBA current account regression.³⁸

³⁷See, for instance, <http://www.imf.org/external/np/res/eba/pdf/080913.pdf>.

³⁸The EBA regression is estimated on a sample of 49 mostly advanced and emerging market economies (covering 90 percent of global GDP) for the period 1986–2000.

The world output gap is computed using the purchasing-power-parity-weighted average of output gaps for all economies recorded in the IMF's WEO database.

Cyclically adjusted current account balances are calculated for the Group of Twenty economies using three country-specific output gap measures: (1) the output gap reported in the WEO, (2) the difference between the 2013 level of GDP implied by the 2006 precrisis trend (calculated using the average growth rate for 1998–2005), and (3) a hybrid of (1) for the United States and China and (2) for all other economies.

The cyclical components are then aggregated separately for surplus and deficit Group of Twenty economies and subtracted from the sum of their raw balances to arrive at cyclically adjusted current account balances for the two country groups.³⁹ These are compared with the “unadjusted” current account surpluses and deficits (actual current account balances), calculated for the full sample of economies in the WEO.

Measures calculated using (1) deliver a narrowing of 2.6 percent of world GDP (dashed lines in panel 1 of Figure 4.9), 1.5 percent using (2) (solid lines in panel

³⁹Economies are classified as surplus or deficit based on their positions in 2006.

2 of Figure 4.9), and 2 percent using (3) (dashed lines in panel 2 of Figure 4.9).

Appendix 4.5. Vulnerability Thresholds

To establish the level at which a current account deficit (or net liability position) exposes a country to significantly greater risk, a threshold value is chosen so as to minimize the percentage of crises missed and the percentage of noncrises misclassified (type I and type II errors, respectively). By defining the loss function in terms of the percentages of crises and noncrises, the estimation penalizes missing a crisis much more heavily than issuing a false alarm (for example, if crises are 5 percent of the sample, missing one crisis is as costly as issuing 19 false alarms).

Four types of crisis are considered: banking, currency, and debt crises (from Laeven and Valencia 2012), and an indicator for sudden stops (from Chapter 4 of the April 2012 WEO); a comprehensive crisis indicator, which takes the value of one if there is at least one crisis in a given year, is also defined. The model is estimated using lagged values for the current account and net

foreign asset position, since these variables may adjust sharply following a crisis (and vulnerabilities are better captured by the lagged value, that is, before the postcrisis adjustment). For that reason, observations in the year following a crisis are excluded from the estimation.

The exercise is performed for two samples of economies. The first sample consists of 34 advanced economies and corresponds to the sample used in the IMF's Vulnerability Exercise for Advanced Economies. The second sample consists of 53 emerging market and developing economies. It includes the sample used in the IMF's Vulnerability Exercise for Emerging Market and Developing Economies, as well as recently designated advanced economies that were emerging market and developing economies in the historical sample (for example, Korea). The data cover the period 1980–2010. Table 4.8 reports the results for the different crises. To obtain the average threshold (used in the chapter text), a weighted average of the thresholds for the different crises is calculated, in which the weights are proportional to the explanatory power of the threshold for the type of crisis with which it is associated (1 minus the sum of type I and type II errors).

Box 4.1. Switching Gears: The 1986 External Adjustment

Another exceptional episode of adjustment in global imbalances began in 1986 following an agreement between the largest deficit and surplus economies. This box highlights how expenditure switching featured more heavily in this episode against a backdrop of relatively strong global economic conditions.

The Plaza Accord of September 1985 initiated a period of adjustment in global imbalances. The accord among the world's five largest economies (the Group of Five) sought to limit the widening imbalances between the world's largest deficit economy (the United States) and largest surplus economies (Japan and West Germany). The agreement would work through coordinated foreign exchange rate interventions that would help depreciate the U.S. dollar against other currencies, mainly the Japanese yen and the German deutschmark (or "appreciate nondollar currencies").¹ As a result, absolute global current account imbalances declined during the five years beginning in 1986 at an average annual rate of ¼ percent of world GDP, resulting in a total adjustment of 1¼ percent by 1991 (Figure 4.1.1).

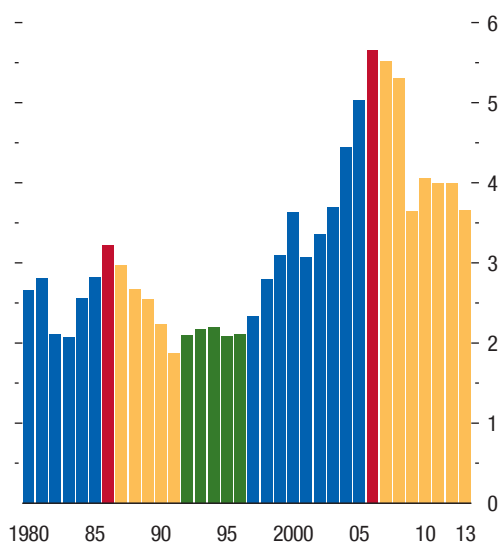
The configuration of imbalances at the start of the adjustment in 1986 was similar to that of 2006, with deficits and surpluses largely concentrated in a handful of systemically important economies (Table 4.1.1). As of 1986, the U.S. current account deficit accounted for three-fourths of the sum of the world's top 10 deficits, and the combined surpluses of Japan and West Germany were almost as large in dollar terms. By 1991, the U.S. external imbalance had moved into surplus and accounted for the lion's share of the reduction in the world's largest deficits. The primary counterparts to this adjustment on the surplus side (switching from surplus to large deficits) were Germany, which was undergoing reunification, and Spain. Therefore, the share of Japan and the United States in absolute global imbalances declined from more than 50 percent in 1986 to 17 percent in 1991.

Unlike the adjustment in the recent period, the adjustment that began in 1986 took place against a relatively more benign global economic landscape, with GDP across major deficit and surplus economies remaining close to or above trend during this period. GDP in the United States remained close to preadjust-

The authors of this box are Aqib Aslam and Juan Yépez.

¹See Funabashi 1988. In fact, the dollar had already started depreciating from its peak in March 1985, but the pace of depreciation picked up following the Plaza Accord.

Figure 4.1.1. Global Current Account Imbalances in Absolute Terms
(Percent of world GDP)



Source: IMF staff calculations.

Note: Yellow bars highlight main periods of adjustment in absolute global imbalances, with red bars marking the beginning year of the adjustment period. Green bars highlight extended period of compressed absolute imbalances following the 1986–91 adjustment. Blue bars are used for all other years.

ment trends, and those in major surplus economies climbed above trend. Overall, global GDP growth remained steady between 1987 and 1989, dipping only in 1990 as the United States fell into recession.

A key difference between the two periods of adjustment is the relatively larger role for expenditure switching in the earlier episode. Expenditure switching between foreign-produced and domestically produced goods was inevitable given that the adjustment was engineered through exchange rate intervention, and the result was an 11 percent real appreciation of the yen during the period 1986–88 and a 15 percent real depreciation of the dollar.² However, outside these two major

²Indeed, the Plaza Accord succeeded too well: concerned that the sharp depreciation of the dollar was disrupting currency markets, ministers from the parties to the agreement as well as from Canada (the Group of Six) met at the Louvre in February 1987 (the "Louvre Accord") seeking to "put the brakes" on the dollar decline. The dollar continued to depreciate, however, with the depreciation ultimately resulting in the October 1987 stock

Box 4.1 (continued)

Table 4.1.1. Largest Deficit and Surplus Economies, 1986 and 1991

	1986				1991		
	Billions of U.S. Dollars	Percent of GDP	Percent of World GDP		Billions of U.S. Dollars	Percent of GDP	Percent of World GDP
1. Largest Deficit Economies							
United States	-147.2	-3.2	-1.05	Italy	-29.9	-2.5	-0.10
Saudi Arabia	-11.8	-13.6	-0.08	Saudi Arabia	-27.5	-20.9	-0.09
Canada	-11.2	-3.0	-0.08	Kuwait	-26.2	-242.2	-0.09
Australia	-9.2	-5.0	-0.07	Germany	-24.3	-1.3	-0.08
Iran	-5.7	-6.8	-0.04	Canada	-22.4	-3.7	-0.07
Brazil	-5.7	-2.1	-0.04	Spain	-20.0	-3.6	-0.07
United Kingdom	-5.3	-0.9	-0.04	United Kingdom	-14.9	-1.4	-0.05
India	-4.6	-1.8	-0.03	Mexico	-14.6	-4.1	-0.05
Norway	-4.5	-5.9	-0.03	Iran	-11.2	-11.5	-0.04
Denmark	-4.5	-5.2	-0.03	Australia	-10.6	-3.3	-0.04
Total	-209.5	-47.5	-1.5	Total	-201.8	-294.4	-0.7
2. Largest Surplus Economies							
Japan	84.5	4.1	0.60	Japan	68.1	1.9	0.23
West Germany	38.5	4.2	0.27	Taiwan Province of China	12.5	6.7	0.04
Taiwan Province of China	16.3	21.0	0.12	Switzerland	10.2	4.1	0.03
Switzerland	6.7	4.6	0.05	Netherlands	7.5	2.5	0.02
Kuwait	5.7	32.6	0.04	Norway	5.0	4.2	0.02
Netherlands	4.4	2.4	0.03	Singapore	4.9	10.7	0.02
Spain	3.7	1.5	0.03	Belgium	4.8	2.3	0.02
Belgium	3.1	2.7	0.02	Hong Kong SAR	3.8	4.3	0.01
South Africa	2.8	4.2	0.02	United States	2.9	0.0	0.01
Korea	2.8	2.3	0.02	Brunei Darussalam	2.6	69.3	0.01
Total	168.4	79.6	1.2	Total	122.2	106.1	0.4

Source: IMF, World Economic Outlook database.

Table 4.1.2. Panel Regression Results: Post-Plaza Accord versus Post-2006 Current Account Adjustments

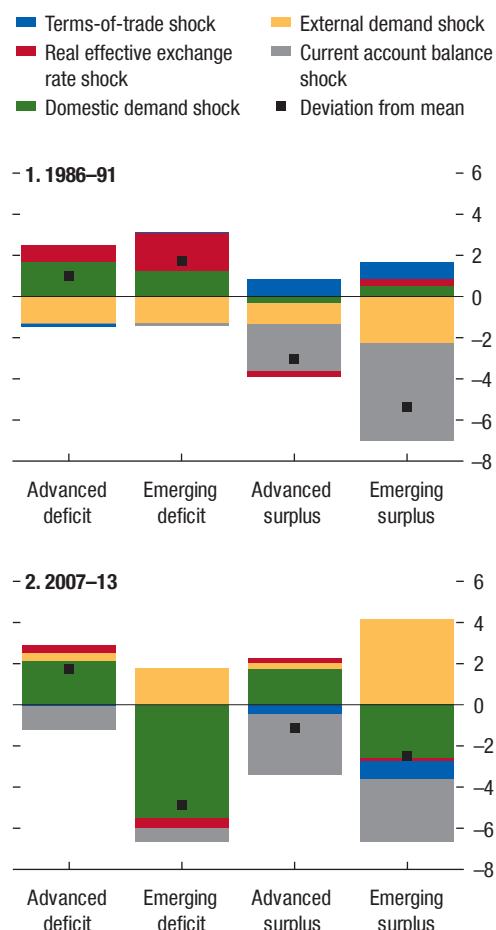
	(1)	(2)	(3)	(4)	(5)
	1986–91 Adjustment Period			2007–13 Adjustment Period	
Real Domestic Demand (YoY change, percent)	-0.31*** (-4.86)	-0.33*** (-5.20)		-0.48*** (-9.26)	-0.47*** (-8.96)
Real Domestic Demand, Trading Partners (YoY change, percent)	0.15 (1.18)	0.16 (1.27)		0.07 (0.64)	0.08 (0.77)
Real Effective Exchange Rate (CPI based) (YoY change, percent)	-0.04* (-1.71)		-0.06*** (-3.93)	0.04 (1.35)	
Terms of Trade (YoY change, percent)	0.10*** (2.69)	0.10** (2.63)	0.05 (1.42)	0.11*** (2.81)	0.12*** (2.98)
R^2 (within)	0.31	0.29	0.06	0.48	0.47
R^2 (overall)	0.30	0.27	0.05	0.48	0.47
Standard deviation of residuals within groups	0.84	0.94	0.96	0.96	0.99
Standard deviation of residuals	1.96	1.98	2.28	2.54	2.55
Intraclass correlation	0.16	0.18	0.15	0.12	0.13
Number of observations	242	242	242	384	384
Number of countries	50	50	50	64	64

Source: IMF staff estimates.

Note: t -statistics in parentheses. CPI = consumer price index; YoY = year over year.* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Box 4.1 (continued)

Figure 4.1.2. Historical Decomposition of Current Account Adjustment



Source: IMF staff calculations.

Note: Advanced deficit = Australia, Czech Republic, Estonia, France, Greece, Iceland, Ireland, Italy, Latvia, New Zealand, Portugal, Slovak Republic, Slovenia, Spain, United Kingdom, United States; advanced surplus = Austria, Belgium, Canada, Denmark, Finland, Germany, Hong Kong SAR, Israel, Japan, Korea, Netherlands, Norway, Singapore, Sweden, Switzerland, Taiwan Province of China; emerging deficit = Bulgaria, Colombia, Costa Rica, Croatia, Dominican Republic, El Salvador, Guatemala, Hungary, India, Lithuania, Mexico, Pakistan, Poland, Romania, Serbia, South Africa, Sri Lanka, Thailand, Tunisia, Turkey, Uruguay; emerging surplus = Argentina, Brazil, Chile, China, Indonesia, Malaysia, Morocco, Peru, Philippines, Russia, Ukraine.

surplus and deficit economies, there was no strong change in the direction of real effective exchange rates, and the rest of the world's absolute level of imbalances remained the same as a portion of world GDP.

The relatively greater role for expenditure switching in the 1986 episode can be seen in a panel regression that examines the contribution of domestic demand and the real effective exchange rate in the 1986-91 and 2006-13 current account adjustment periods (Table 4.1.2). For example, in the years following the Plaza Accord, a 10 percentage point reduction in the real appreciation rate increases the rate of adjustment of the current account by 3 percentage points, an effect that is statistically significant. In contrast, although the estimate is larger in the most recent adjustment period, its effect is not statistically significant.

At the same time, if the demand variables of the panel regression are dropped, the R^2 of the 1986-91 period is larger than that of the 2007-13 adjustment period, and the coefficient of the real effective exchange rate becomes larger and more statistically significant. The contemporaneous relationship between the real effective exchange rate, the terms of trade, and the current account is complex because these variables are jointly determined; therefore, the estimates from these regressions could be biased.

The stronger role of expenditure switching in the second half of the 1980s is also recovered using a complementary framework—a parsimonious panel vector autoregression—in which the issue of potential endogeneity can be better addressed. Historical decompositions (Figure 4.1.2) of the current account adjustment into demand and price factors show that shocks to the real effective exchange rate can explain one-third of the improvement in the current account from its historical average for advanced and emerging market deficit economies (red segments) in the years immediately following the Plaza Accord (compared with one-eighth in the 2007-13 adjustment period).³

market crash, when coordinated interest rate cuts by Group of Seven (adding Italy to the group) central banks allowed them to inject liquidity without exerting further stress on exchange rates; see Ghosh and Masson 1994, chapter 4.

³The historical decomposition is obtained from a panel vector autoregression for 64 economies calculated for the 1973-2013 period using annual data. The identification strategy is based on contemporaneous restrictions based on the following recursive ordering: the terms of trade; the real effective exchange rate; and the changes in real external demand, real domestic demand, and the current account balance as a share of GDP; therefore, there

Box 4.1 (continued)

Overall, the key lesson from the 1986 episode is that, in a favorable global economic environment, a policy-engineered current account adjustment can prove to be both effective and durable. Imbalances remained compressed in the aftermath of the 1991 global recession until as late as 1996, making this the longest period of current account narrowing since the

is a series of shocks for each variable in the model. Results are qualitatively robust to different orderings.

Bretton Woods era (see green bars in Figure 4.1.1). Therefore, the Plaza Accord, although not without its detractors, provides some insight into how policy-induced expenditure switching could reduce external imbalances and in some cases boost growth.⁴

⁴Some commentators blame the Plaza and Louvre Accords for igniting the expansionary policies that led to Japan's asset boom and bust, which triggered that country's "lost decade" in the 1990s. See Box 4.1 of the April 2010 *World Economic Outlook*.

Box 4.2. A Tale of Two Adjustments: East Asia and the Euro Area

The experiences of the stressed euro area economies during the recent euro area sovereign debt crises stand in contrast to those of the Asian market economies during the Asian financial crisis of the late 1990s. The difference between these two groups in their patterns of adjustment is stark: East Asian economies were able to rely on demand-switching effects to a much greater degree than have the stressed euro area economies and thereby avoided the prolonged contraction in output that has afflicted the latter.

Financial crises erupted in Asia starting in Thailand in July 1997 before spreading to other economies in the region. Four of the affected economies—Indonesia, Korea, Malaysia, and Thailand (the “East Asia-4”)—all experienced severe recessions. More than a decade later, three euro area economies—Greece, Ireland, and Portugal—became embroiled in sovereign debt crises in the wake of the global financial crisis, and one other in the euro area—Spain—faced strong funding pressures arising from banking sector problems. As a result, these four economies also experienced sharp economic downturns (the “stressed euro area-4”). Both the East Asian and the stressed euro area economies endured sizable external adjustments, though the current account swing in the former was much more abrupt than that in the latter (Figure 4.2.1).

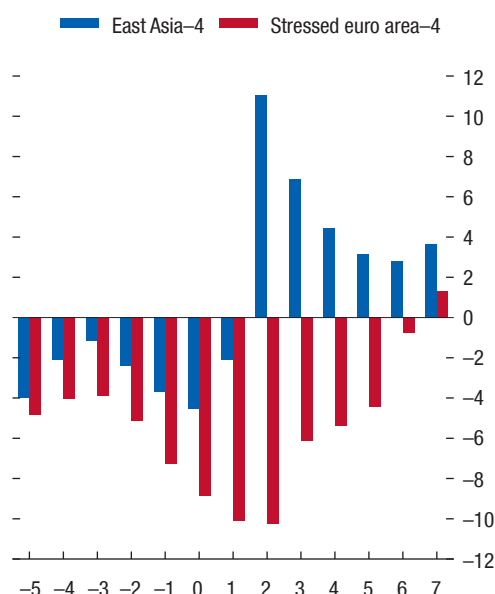
The experiences of the two groups of economies share some important similarities and differences. Both groups experienced what appear to be permanent losses in output in the aftermath of their respective crises (Figure 4.2.2). By the end of 1998, average real output growth in the East Asia-4 had fallen to -10 percent, and during the Great Recession, average annual growth in the stressed euro area economies turned negative, falling to -4 percent in 2009.¹

Yet the subsequent paths for output and current accounts in the two sets of economies have differed

The author of this box is Aqib Aslam.

¹The two groups shared two other important similarities when their respective crises struck, notably fixed or semifixed exchange rates and large current account deficits. Indonesia, Korea, and Thailand operated such exchange rate regimes before the crisis, and the stressed euro area group was subject to fixed exchange rates in respect to one another and their major regional trading partners. In the East Asia case, current account deficits were mainly associated with private sector overinvestment, creating downward pressure on the currencies in the region and encouraging speculative attacks. Current account imbalances in most of the stressed euro area economies were instead partly linked to fiscal imbalances.

Figure 4.2.1. Current Account Balances
(Percent of regional GDP)



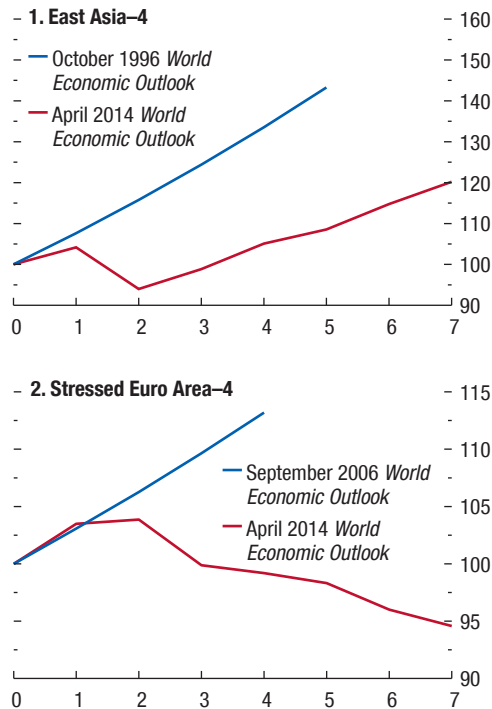
Source: IMF staff calculations.

Note: The horizontal axis depicts years, with year 0 being 1996 for the East Asia economies and 2006 for the stressed euro area economies. East Asia-4 = Indonesia, Korea, Malaysia, Thailand; stressed euro area-4 = Greece, Ireland, Portugal, Spain.

markedly. In the East Asia-4, output growth recovered relatively quickly, returning within a few years to rates closer to those observed before the crisis. In contrast, pressures from the region's sovereign debt crisis meant that activity in the stressed euro area economies contracted again in early 2011 and started to rebound only in the second half of 2013. As a result, output in the stressed euro area-4 remains firmly below 2006 projections and has yet to recover. Therefore, relative patterns in aggregate demand changes and expenditure switching could shed light on the differences in external adjustment.

In the East Asia-4, average real domestic demand growth plummeted to -18 percent in 1998 before recovering the following year (Figure 4.2.3). The corresponding drop in the stressed euro area economies was not as great, at about -6 percent in 2009.

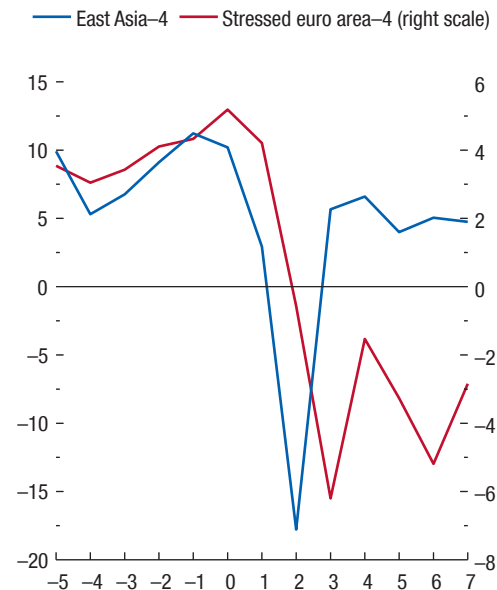
Box 4.2 (continued)

Figure 4.2.2. Real GDP
(Index, year 0 = 100)

Source: IMF staff calculations.

Note: The horizontal axis depicts years, with year 0 being 1996 for the East Asia economies and 2006 for the stressed euro area economies. East Asia-4 = Indonesia, Korea, Malaysia, Thailand; stressed euro area-4 = Greece, Ireland, Portugal, Spain.

However, the protracted nature of the euro area crisis has meant that domestic demand in these economies has continued to shrink, on average, by slightly more than 3 percent per year since 2008. Furthermore, the average growth of external demand for the East Asia-4 was stronger than that for the stressed euro area-4. That strength boosted exports, which in turn improved the current account balance and economic growth. Indeed, real domestic demand among the major trading partners of the East Asia-4 grew during the postcrisis period (Figure 4.2.4). In contrast, the weak external demand for the four stressed euro area economies reflected the severity of the Great Recession

Figure 4.2.3. Real Domestic Demand Growth
(Percent)

Source: IMF staff calculations.

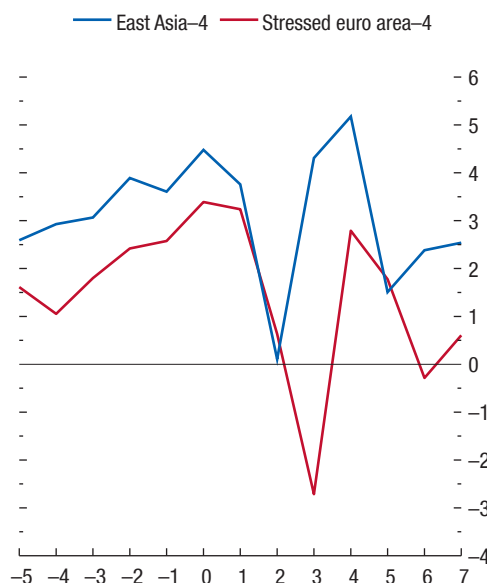
Note: The horizontal axis depicts years, with year 0 being 1996 for the East Asia economies and 2006 for the stressed euro area economies. East Asia-4 = Indonesia, Korea, Malaysia, Thailand; stressed euro area-4 = Greece, Ireland, Portugal, Spain.

and the anemic global recovery, an environment that made the external adjustment and growth recovery for that group much more challenging than for the East Asian economies.

Another key divergence in experiences is the extent of expenditure switching. Most of the economies in the East Asia-4 abandoned their de facto currency pegs soon after the crisis hit, experiencing sharp real depreciations that ranged from 15 percent to 50 percent (Figure 4.2.5).² By contrast, real effective exchange rate movements for the stressed euro area economies have been much smaller; the average real depreciation peaked at 2.5 percent in 2010 and then

²In most cases, these economies also resisted subsequent nominal and real currency appreciations by accumulating reserves to replenish their depleted stocks of foreign exchange reserves.

Box 4.2 (continued)

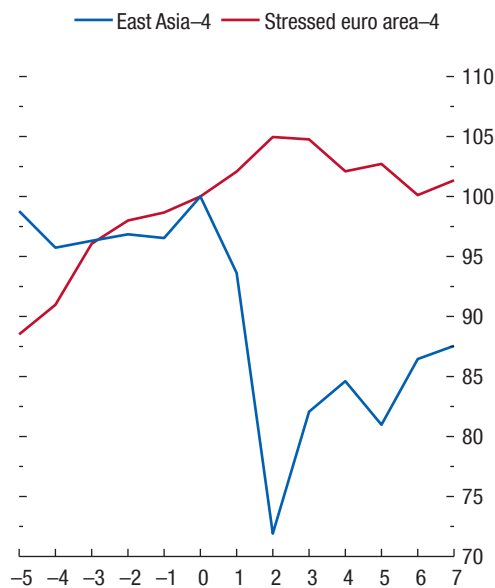
Figure 4.2.4. Real External Demand Growth (Percent)

Source: IMF staff calculations.

Note: The horizontal axis depicts years, with year 0 being 1996 for the East Asia economies and 2006 for the stressed euro area economies. The figure depicts the weighted average of real domestic demand for trading partners of each country. East Asia-4 = Indonesia, Korea, Malaysia, Thailand; stressed euro area-4 = Greece, Ireland, Portugal, Spain.

again in 2012. Instead, these economies have had to rely on slow and painful internal wage and price declines to improve their competitiveness.

These relative differences in the effects of demand compression and switching on external balances can be traced through the changes in saving, investment, and the trade balance. In both episodes, the reduction in domestic demand manifested itself as a sharp contraction in investment. For instance, in East Asia, the abrupt collapse in investment in response to the capital flow reversal led to a marked improvement in current account balances. Broadly similar patterns were observed for the stressed euro area economies, although the decline in investment was more moderate and protracted.

Figure 4.2.5. Real Effective Exchange Rates (CPI Based) (Index, year 0 = 100)

Source: IMF staff calculations.

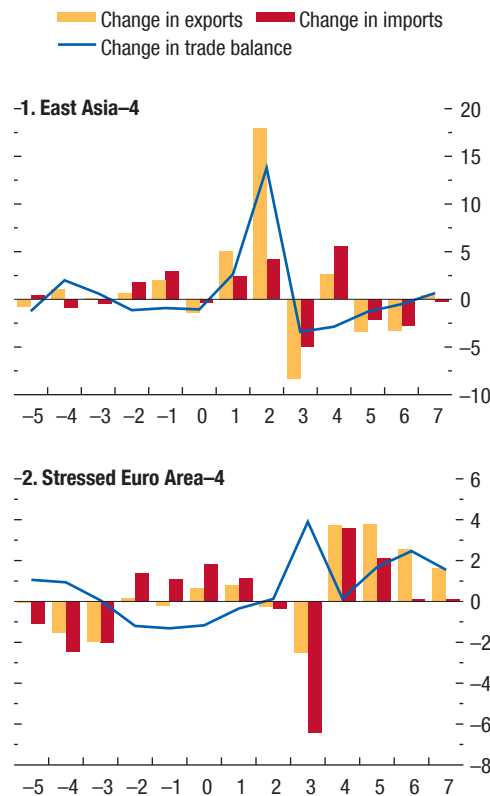
Note: CPI = consumer price index. The horizontal axis depicts years, with year 0 being 1996 for the East Asia economies and 2006 for the stressed euro area economies. East Asia-4 = Indonesia, Korea, Malaysia, Thailand; stressed euro area-4 = Greece, Ireland, Portugal, Spain.

The marked improvement in East Asian trade balances reflects both the effects of demand compression on imports (a decrease) and the effects of demand switching on exports (an increase) and imports (a further decrease) (Figures 4.2.6 and 4.2.7). The improved trade balance was complemented by stronger exports resulting from buoyant external demand. In contrast, the improvement in the stressed euro area-4's trade balance has been largely due to the effects of demand compression on imports and the drag on exports from a weak external environment. With insufficient expenditure switching, exports have only recently returned to precrisis levels for the region on average (see Figure 4.2.7).

When both expenditure reduction and expenditure switching are at work, external adjustment can clearly

Box 4.2 (continued)

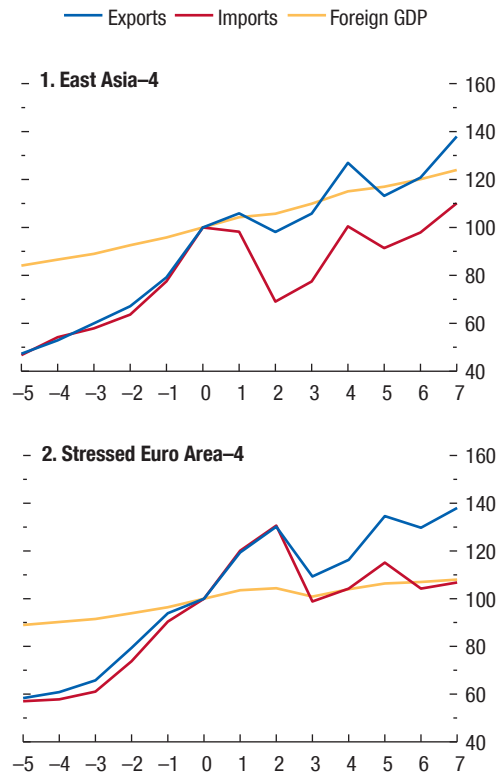
Figure 4.2.6. Exports and Imports as a Share of GDP
(Percent of regional GDP)



Sources: IMF, Balance of Payments Statistics database; and IMF staff calculations.
Note: The horizontal axis depicts years, with year 0 being 1996 for the East Asia economies and 2006 for the stressed euro area economies. East Asia-4 = Indonesia, Korea, Malaysia, Thailand; stressed euro area-4 = Greece, Ireland, Portugal, Spain.

be substantially quicker and potentially less painful. For the East Asian economies, in which both those mechanisms were in play, current account imbalances corrected sharply within two years of the genesis of the crisis. In contrast, it has taken the stressed euro

Figure 4.2.7. Real Exports, Imports, and Foreign GDP
(Index, year 0 = 100)



Sources: IMF, Balance of Payments Statistics database; and IMF staff calculations.
Note: The horizontal axis depicts years, with year 0 being 1996 for the East Asia economies and 2006 for the stressed euro area economies. East Asia-4 = Indonesia, Korea, Malaysia, Thailand; stressed euro area-4 = Greece, Ireland, Portugal, Spain.

area economies seven years to move to surpluses. However, sudden stops wreaked far greater havoc on the financial systems and output of the East Asia-4 than did the financial and sovereign debt crises on the economies of the stressed euro area, a difference partly reflecting the automatic stabilizers that operated within the Economic and Monetary Union.

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