Estimates of Fundamental Equilibrium Exchange Rates, May 2013

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This study presents new estimates of fundamental equilibrium exchange rates (FEERs), taking as its point of departure the medium-term projections of current account balances in the most recent *World Economic Outlook* (WEO) of the International Monetary Fund (IMF 2013a).[1] Once again it is found that the key cases of the United States and China involve only modest over- and undervaluation, respectively, in contrast to the 2006–07 period when the imbalances for the two economies were extreme and much larger exchange rate corrections were needed. The principal new misalignment identified in the estimates is that of Japan, where the depreciation is judged to have overshot by nearly 10 percent. Other misalignments will be familiar to past readers of this series:

significant overvaluations in Australia, New Zealand, South Africa, and Turkey; and large undervaluations in Singapore, Taiwan, Sweden, and Switzerland.

The main estimates provide the basis for consideration of policy implications. These include the question of whether and at what point it might be appropriate for Japan and the major economies to intervene to prevent a substantial further depreciation of the yen. The policy discussion also considers what might be the appropriate nature of a Currency Code of Conduct for the G-7, G-20, and other leading nations.

The study concludes by adding a variant of the calculations in which rich countries with prospective current account deficits (notably an English-speaking league that includes the United States, Canada, the United Kingdom, Australia, and New Zealand) are set a floor target of at least a zero current account balance, and emerging market economies are set a ceiling target of zero balance. The premise is that in a more balanced international economy, capital would flow from rich to poor countries rather than "uphill" in the reverse direction.[2] A major result is that the appreciation called for in China's currency would be much larger, and the depreciation called for in the case of the US dollar would also be much larger. As a side effect, numerous economies would need to have sizable bilateral appreciations against the dollar even though their effective (trade-weighted) exchange rates would move much more similarly to the pattern in the main set of results.[3]

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1. This semi-annual series of estimates of FEERs began in Cline and Williamson (2008) and was coauthored with John Williamson until his retirement at the end of 2012. The FEERs calculations examine the extent to which exchange rates need to change in order to curb any prospectively excessive current account imbalances back to limits consistent with sustainability. For a summary of the methodology, see Cline and Williamson (2012a, appendix A), available here: http://www.piie.com/publications/pb/pb12-14.pdf.

2. As pointed out to me by my colleague Ted Truman, net private capital flows have been in the traditional downhill direction; it is only official flows, in the form of intervention to build up reserves that have caused the total net flows to be uphill. The direction of net capital flows thus remains within the power of the authorities in emerging market economies to control themselves. Estimates by the IIF (2013) support this diagnosis. Annual averages for 2011–12 were as follows, for 30 major emerging market economies combined: current account surplus (and hence net capital outflow) was $307 billion; private capital inflows were $1.08 trillion; private capital outflows were $850 billion; reserves buildup was $522 billion.

3. In part the aggressive rebalancing simulation seeks to take account of the spirit of recent work by my colleagues C. Fred Bergsten and Joseph E. Gagnon (2012), who argue that exchange rate intervention by many (mainly emerging market) economies has artificially raised their current account surpluses and correspondingly unduly widened the current account deficit of the United States in particular.

POLICY CONTEXT

The spring 2013 round of FEERs estimates takes place in a relatively benign if lackluster international economic environment. The US economy averted a "fiscal cliff" crisis at the turn of the year. Ten months after the president of the ECB pledged to "do whatever it takes" to preserve the euro by carrying out "Outright Monetary Transactions" purchases of periphery-economy sovereign bonds if necessary to combat panic-level interest rates and if accompanied by adjustment programs, the euroarea debt crisis has eased at least temporarily.[4] The equity market has reached all-time highs in nominal (but not real)

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terms in the United States, and has returned to about three-fourths of the peak level in other developed economies.[5] Global growth is on track to hold steady in 2013 (at 3.3 percent versus 3.2 percent in 2012) and rise in 2014 (to 4.04 percent; IMF 2013a). Although slight recession will continue in the euro area (with growth of –0.3 percent instead of –0.6 percent last year), modest growth is projected by the Fund to resume in 2014–15 (averaging 1.3 percent).

The global economy nonetheless faces major challenges and risks. Unemployment remains high (at 7.5 percent in the United States for April, 12.1 percent in the euro area for March, and about 27 percent in Spain and Greece for March).[6] Normal

policy levers are close to being broken, with interest rates at the zero-bound level in the United States and almost so in the euro area, and with the lack of fiscal space following the run-up in public debt associated with the Great Recession constraining fiscal policy. Recourse to the relatively unfamiliar instrument of quantitative easing on a large scale has become the macro policy tool of last resort in the United States, United Kingdom, arguably the euro area, and now (once again), Japan.[7] Thus, from August 2008 to December 2012, central banks expanded their balance sheets by 12 percent of GDP in the United States, 16.2 percent in the euro area, 19.5 percent in the United Kingdom, and 11.5 percent in Japan (OECD 2013, 22).

Quantitative easing has prompted repeated "currency war" critiques by authorities in such economies as Brazil and Russia on grounds that it has prompted capital flows to, and pushed up exchange rates in, emerging-market economies, as well as complaints from leading financial figures in China and Korea that it has caused major competitive losses for their economies vis-à-vis Japan.[8] To some extent this concern likely reflects the fact that quantitative easing is relatively new and unfamiliar. In the past, an economy reducing interest rates to combat unemployment would have been less likely to provoke foreign complaints about currency consequences, because the traditional form of monetary easing would have been more clearly seen as a standard response to a cyclical downturn.

Nowhere is prospective quantitative easing greater than in the aggressive economic program of the new Abe government in Japan, with its goal of raising the inflation rate to 2 percent from its recent level of close to zero.[9] The Bank of Japan plans to double the monetary base, defined as currency plus banks' reserves, from end-2012 to end-2014. Doing so will involve doubling the pace of government bond purchases, to a rate of 1.5 percent of GDP monthly (OECD 2013, 23). This pace would

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4. Sovereign spreads above the 10-year German bund have fallen from peaks of 540 basis points (Italy) and 630 basis points (Spain) in late July 2012, to 250 and 290 basis points respectively in early May 2013 (Datastream, accessed via subscription on May 13, 2013). The banking crisis in Cyprus and austerity fatigue in the euro area periphery in the face of high unemployment and disappointing growth have however been symptoms of continuation of the euro area crisis despite improvements in sovereign debt market conditions.

5. On May 10, 2013, the S&P 500 index closed at 1634, compared to its 677 trough of March 9, 2009 and its prior peak of 1565 on October 9, 2007. The MSCI EAFE index for major developed country markets excluding the United States and Canada had peaked at 2389 in 2007, fallen to a trough of 911 in 2009, recovered to 1810 in early May of 2011, retreated to 1308 in early June 2012 in the face of the euro area crisis, and by May 10, 2013 returned to 1759 (Bloomberg, accessed via subscription on May 13, 2013).

6. BLS (2013), Eurostat (2013).

7. Although the ECB does not view its intervention as quantitative easing, its balance sheet has risen even more than that of the Federal Reserve (as a percent of GDP). The increases primarily reflect the Long-Term Refinancing Operations (LTROs) provided to banks, and Securities Markets Program (SMP) purchases of government bonds, both designed to address the debt crisis in the euro area periphery.

8. The head of China's sovereign wealth fund stated that Japan is using its neighbors as a "garbage bin" by intentionally devaluing the yen. South Korea's finance minister has stated that the decline in the yen is creating more difficulties for the economy than North Korea's threats of war. Grace Zhu and Tom Orlik, "Lagarde Praises Tokyo's Easing," *Wall Street Journal*, April 7, 2013; Cynthia Kim, "South Korea's Hyun Says Yen Bigger Issue than North Korea," *Bloomberg*, April 18, 2013. For their part, authorities in Brazil and Russia have recently emphasized concern that there could be an escalation of currency wars if Europe were to pursue exchange rate depreciation. Alonso Soto and Luciana Otoni, "Global Currency War Could Get Nastier, Warns Brazil's Mantega," *Reuters*, February 8, 2013; Simon Kennedy and Scott Rose, "Russia Says World is Nearing Currency War as Europe Joins," *Bloomberg*, January 16, 2013.

9. Japan's consumer price index fell 0.3 percent from January 2012 to January 2013 (IMF 2013b).

boost the central bank's balance sheet from about one-third of GDP at the end of 2012 to about two-thirds by end-2014.[10] The new policies have resulted in a plunge of the yen by 23 percent against the dollar from September 2012 to mid-May 2013. The sharp decline in the yen constitutes perhaps the leading current challenge to international policy on exchange rates.

So far the G-20 has not criticized Japan's new economic program despite the sharp depreciation of the yen. However, in mid-February, G-20 finance ministers and central bank governors issued a cautionary statement that "We will refrain from competitive devaluation. We will not target our exchange rates for competitive purposes."[11] In early April Christine Lagarde, Managing Director of the International Monetary Fund, stated that Japan's proposed quantitative easing was a "welcome step" and that quantitative easing had "helped prop up the advanced economies and in turn global growth."[12] Importantly, the falling yen reflected market expectations of the consequences of the new program, not direct intervention in the exchange market. Indeed, the Governor of the Bank of Japan has stated specifically that "The Bank of Japan isn't targeting currency rates, which are determined by the market."[13] The question going forward, however, is how far the yen would have to fall before G-7 (and G-20) authorities decided it was time to pursue joint intervention to prevent a further decline because the markets had carried the currency far too low.[14] The more fundamental questions are how much the program can reasonably be expected to boost Japan's growth, and the extent to which such increased growth will come from increased domestic demand as opposed to an increase in trade surpluses at the expense of other nations also coping with unemployment.

THE YEN AND JAPAN'S CURRENT ACCOUNT

The sharp depreciation of the yen associated with Abenomics has been the most dramatic currency development since the previous issue of FEERs estimates (Cline and Williamson 2012b). The real effective exchange rate of the yen was approximately constant during 2011 and most of 2012. Then from September to April the real effective exchange rate (REER) fell

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10. Assuming purchases of 1.5 percent of GDP for 20 months beginning in May 2013.

11. Charles Clover, Robin Harding, and Alice Ross, "G20 Agrees to Avoid Currency Wars," *Financial Times,* February 17, 2013.

12. Zhu and Orlik, "Lagarde Praises Tokyo's Easing," *Wall Street Journal*, April 7, 2013.

13. "BOJ chief Kuroda says BOJ does not target Forex Rates." *Reuters*, May 10, 2013.

14. Note that the yen fell from 93.5 per dollar on February 15, at the time of the G-20 statement, to an average of 102.3 per dollar in May 10–23, 2013.

by 21.9 percent.[15] Against the dollar, the average value of the yen was 79.8 per US dollar in 2011 and again in 2012 (IMF 2013b). At the end of October 2012, the currency remained unchanged at 79.9 per dollar. It then began a rapid descent, reaching 86.5 to the dollar at the end of December; 97.7 for the month of April as a whole; and 102.5 on May 21 (IMF 2013b*; Datastream, accessed via subscription on May 22, 2013; Bloomberg, accessed via subscription on May 22, 2013). From October to April (the base periods of the previous and current FEERs estimates), the real effective exchange rate of the yen fell by 20.4 percent, and the currency fell 23.1 percent against the dollar. [16]

Within the general framework of the FEERs methodology, such a large depreciation would have been expected to yield a relatively large increase in the current account surplus, other things being equal. The Symmetric Matrix Inversion Method (SMIM) model impact parameter for Japan is 0.154, so a real effective depreciation of 20 percent would be expected to increase the current account surplus by 3.14 percent of GDP (=0.154 × 20.4), after lags are complete. It is thus in principle a major surprise that in its new April 2013 WEO, the IMF has left its medium-term projection for Japan's current account virtually unchanged. Thus, in the October 2012 WEO the Fund placed the 2017 surplus at 1.93 percent of GDP; the April 2013 WEO has the corresponding estimate at 1.83 percent of GDP, slightly lower rather than 3 percent of GDP higher.

IMF elasticity pessimism seems to explain the bulk of this paradox of current account stasis despite a large exchange rate move, although other influences explain at least some of it. First, the actual current account surplus in 2012 came in much lower than the Fund had originally projected. The April 2012 WEO projected the surplus at 2.2 percent of GDP (IMF 2012a), and the October 2012 WEO, at 1.59 percent of GDP (IMF 2012b). The actual outcome was only 1.0 percent of GDP. One reason may be that the shut-down of part of Japan's nuclear energy capacity following the Fukushima earthquake in March 2011 contributed to a large increase in Japan's oil and liquefied gas imports, amounting to about 0.5 percent of GDP in 2012.[17] Second, the prospect of higher growth from at least

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15. With a base of 2007 = 100, the REER stood at 121.7 on average in 2011, 121.7 again on average in January through September, and 95.0 in April.

16. Unless otherwise stated, real effective exchange rates are an index that includes the 34 economies of this study, accounting for 91.4 percent of world product in 2012 (IMF 2013a). The index deflates using consumer prices, and applies 2011 trade weights. This index, which begins in 2007, closely tracks the corresponding broad index of the Bank for International Settlements (BIS 2013) and, for the United States, the Broad Real index for the dollar (Federal Reserve 2013).

17. Energy imports excluding coal rose from 20.9 trillion yen in 2011 to 23.2 trillion yen in 2012, with LNG imports rising 25 percent in value. Risa Maeda and Osamu Tsukimori, "Japan's 2012 LNG Imports at Record High on Nuclear Woes," Reuters, January 23, 2013. This increase of about $30 bil-

partial success of the new government's three-arrow program (fiscal flexibility, major quantitative easing to achieve a target of 2 percent inflation, and growth-oriented structural changes still to be announced) implies higher imports. Thus, the April 2013 WEO places annual growth at about one-third percentage point higher than in the previous WEO for both 2013 and 2014. With a reasonable income elasticity of imports of 2, by 2014 the cumulative increase in GDP by 0.7 percent would boost imports by 1.4 percent.[18] Imports of goods and services amount to 16.6 percent of GDP, so an increase of 1.4 percent from the previous baseline would amount to 0.23 percent of GDP. Energy trade and faster growth thus account for about three-fourths of a percentage point of GDP in reduction in the current account surplus that would weigh against the direct effect of yen depreciation.

> **This study places Japan's baseline 2018 current account surplus at 4.6 percent of GDP, which is 2.9 percent of GDP higher than the IMF's new projection.**

The estimates here adjust the IMF's current account projection for Japan in 2018 as follows. The initial benchmark is the October WEO projection of a surplus of 1.9 percent of GDP in 2017. Next, the real effective depreciation between the IMF's base period for that estimate (July 30 to August 27) and the IMF's spring WEO base (February 11 to March 11) was 18.9 percent. Applying the impact parameter for Japan, the Fund's projected surplus for 2017 should have increased by 0.154 × 18.9 = 2.9 percent of GDP, reaching 3.8 percent. The further real effective depreciation to April (the base here) was another 4.3 percent, which will have added another 0.66 percent of GDP. Special consideration of energy and faster domestic growth should cut the estimate by 0.75 percent of GDP, as just discussed. So the new 2017 surplus estimate should be 4.71 percent of GDP (=1.9+2.9+0.66 − 0.75). The IMF spring WEO has the 2018 surplus declining by 0.1 percent of GDP from the 2017 level With this further adjustment, this study places Japan's baseline 2018 current account surplus at 4.6 percent of GDP, which is 2.9 percent of GDP higher than the IMF's new projection.

US CURRENT ACCOUNT PROSPECTS

It is also important to consider whether the WEO baseline for the US current account warrants adjustment. The IMF now projects the US current account deficit to stay almost unchanged from its level of 3 percent of GDP in 2012 through 2015, but then to rise gradually to 3.5 percent by 2018.

There has been much attention to the possibility that the hydraulic fracturing technology revolution in production of US gas and oil could sharply reduce dependence on oil imports.[19] The IMF (2013a) projections do show a reduction in oil import values relative to GDP, from 2.78 percent in 2012 to 2.01 percent in 2018. The question is whether this estimate of the reduction is sufficiently large.

In its baseline "reference" projections, the US Energy Information Agency projects that the volume of crude oil, other petroleum liquids, and natural gas imports will fall by 8.7 percent from 2012 to 2018.[20] In its baseline projections the average price of crude oil falls from $100.5 in 2012 to $92.3 per barrel in 2013 but then gradually returns to $99.95 per barrel by 2018. An index of oil and gas import value would thus fall by 9.2 percent from 2012 to 2018. US oil and petroleum product imports stood at $397.5 billion in 2012 (BEA 2013). By implication, the nominal value of oil and gas imports would be only $361.1 billion in 2018, an absolute decline of $36.4 billion. In comparison, the WEO projects oil import values that fall from $436.7 billion in 2012 to $424.4 billion in 2018, a decline of $12.3 billion. The IMF projection thus appears to understate the reduction in dependence on oil imports, but not by much. The incremental reduction implied by the EIA estimates, $24.1 billion in 2018, would represent only 0.11 percent of GDP. On this basis, only a small adjustment to the WEO projection seems to be required from the standpoint of greater energy self-sufficiency. The Fund's projected total current account deficit in 2018 is correspondingly adjusted slightly in the estimates here, from 3.5 percent of GDP to 3.4 percent. Incorporation of the change in the REER of the dollar between the IMF's base period and the April base used here trims the medium-term surplus estimate slightly further, to 3.3 percent of GDP.[21]

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lion represents 0.5 percent of GDP. United Nations trade data similarly report a $30 billion increase in the trade deficit in mineral fuels from 2011 to 2012, to a total of $289 billion in 2012 (United Nations 2013).

18. Note that the IMF has essentially not changed its growth rate projections for 2015 and beyond. Note further that the reduction in the Fund's projection for world growth is too small to be of consequence for Japan's exports, when expressed as a percent of GDP. (The April 2013 projection places 2017 world product at market exchange about 0.5 percent lower than the October 2012 WEO.)

19. Thus, a study by Citigroup projects that US production of oil, natural gas liquids, and biofuels could rise from 9 million barrels per day in 2011 to 11.6 million barrels per day in 2015 and 15.6 million barrels per day in 2020, with a direct influence of reducing the current account deficit by 2.4 percent of GDP in 2020 (Morse et al., 2012, 10–11).

20. From a combined 26.15 quadrillion British thermal units to 23.88 quadrillion British thermal units (EIA 2013).

21. The REER for the dollar fell by 0.4 percent from February 11–March 11 to April.

PROSPECTS FOR EXTERNAL IMBALANCES

With these two important cases adjusted (Japan) or essentially confirmed (United States) application of the standard FEERs methodology yields the results presented in tables 2 and 3. Table 1 first reports the actual changes in exchange rates for 34 economies from October 2012, the base period of the most recent previous estimate of FEERs (Cline and Williamson 2012b), to April 2013. The largest change has been in the Venezuelan bolivar, which has fallen by 46 percent against the dollar in nominal terms and by 22 percent in real effective (trade-weighted) terms.[22] Otherwise the largest change has been the decline of the yen, by 23 percent in nominal terms against the dollar and by 20 percent in real effective terms. A sizable decline in the Argentine peso (by about 10 percent against the dollar and about 5 percent in real effective terms) is also notable. Over this period there have been real effective appreciations of about 9 percent for Mexico and Thailand, and about 5 percent for Brazil and China. The most notable case of a practically unchanged currency is that of the euro. Despite ongoing uncertainty in the euro area, most recently associated with the banking depositor bail-in in Cyprus, the single currency has remained remarkably steady against the dollar and has appreciated slightly in real effective terms.

A counterfactual calculation in which the yen is set to have remained unchanged in real effective terms from October to April reveals that for several economies there has been a non-trivial real effective appreciation as a consequence of the decline in the yen. Without that decline, the real effective appreciations would have been smaller (or the real effective depreciations greater) by 3 to 4 percentage points for Australia, Indonesia, the Philippines, and Thailand; by 2 to 3 percentage points for China, Korea, New Zealand, and Taiwan; and by 1.2 percentage points for the United States (but only 0.6 percentage point for the euro).

Table 2 shows the IMF's current account projections for 2013 and 2018, as well as the expected level of GDP in 2018. The fourth column shows the 2018 current account estimate adjusted for the change in exchange rates from the IMF's base period (February 11 to March 11, 2013) to the April base period of this study. In most cases the adjustments are minor. The sizable adjustment for Japan has been discussed above. The substantial adjustment for Switzerland (to a surplus of 7.3 percent of GDP instead of 11.6 percent) is due to the statistical adjustment of 4.1 percent of GDP to account for

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Table 1   Changes in exchange rates, October 2012 to April 2013

Country	Percent change in REER	Percent change in nominal dollar rate
Argentina	−5.3	−9.7
Australia	4.1	0.8
Brazil	5.8	1.5
Canada	−2.7	−3.3
Chile	1.6	0.7
China	5.1	1.2
Colombia	−0.8	−1.4
Czech Republic	−2.4	−3.2
Euro area	1.5	0.4
Hong Kong	1.8	−0.1
Hungary	−4.9	−5.4
India	1.5	−2.5
Indonesia	3.8	−1.4
Israel	6.9	6.3
Japan	−20.4	−23.1
Korea	0.1	−1.3
Malaysia	2.6	0.2
Mexico	8.7	5.2
New Zealand	4.9	3.3
Norway	−0.6	−1.4
Philippines	4.0	0.6
Poland	−0.3	−0.3
Russia	2.4	−0.7
Saudi Arabia	3.4	0.0
Singapore	1.0	−1.1
South Africa	−1.0	−5.8
Sweden	2.2	2.3
Switzerland	−1.1	−0.5
Taiwan	−2.2	−1.9
Thailand	9.0	5.2
Turkey	3.7	0.3
United Kingdom	−4.1	−5.0
United States	0.3	0.0
Venezuela	−22.3	−46.5

REER = real effective exchange rate

Source: Datastream; author's calculations.

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22. The large decline in Venezuela reflected the 32 percent step devaluation of the exchange rate in mid-February. The bolivar had become seriously overvalued, as the currency had remained unchanged from February 2010 through January 2013 despite persistent inflation at an annual rate of about 25 percent.

Table 2   Target current accounts (CA) for 2018

Country	IMF projection of 2013 CA (percent of GDP)	IMF 2018 GDP forecast (billions of US dollars)	IMF 2018 CA forecast (percent of GDP)	Adjusted 2018 CA (percent of GDP)	Target CA (percent of GDP)
Pacific					
Australia	−5.5	1,831	−5.6	−5.5	−3.0
New Zealand	−5.8	207	−7.2	−7.7	−3.0
Asia					
China	2.6	14,941	4.3	4.0	3.0
Hong Kong	2.0	420	5.0	4.5	3.0
India	−4.9	2,976	−3.4	−3.7	−3.0
Indonesia	−3.3	1,482	−3.3	−3.5	−3.0
Japan	1.2	5,930	1.7	4.6	3.0
Korea	2.7	1,730	1.1	2.2	2.2
Malaysia	6.0	475	4.5	3.2	3.0
Philippines	2.4	451	1.2	1.2	1.2
Singapore	16.9	342	14.4	14.3	3.0
Taiwan	10.3	715	8.7	9.2	3.0
Thailand	1.0	612	−0.1	−1.8	−1.8
Middle East/Africa					
Israel	1.7	332	2.3	1.4	1.4
Saudi Arabia	19.2	905	11.4	10.6	10.6
South Africa	−6.4	468	−6.0	−6.1	−3.0
Europe					
Czech Republic	−2.1	228	−1.8	−1.1	−1.1
Euro area	2.3	14,216	2.5	2.7	2.7
Hungary	2.1	162	−1.8	−1.1	−1.1
Norway	11.7	609	8.2	8.9	8.9
Poland	−3.6	685	−3.6	−3.7	−3.0
Russia	2.5	3,182	0.1	0.4	0.4
Sweden	6.0	730	7.8	7.9	3.0
Switzerland	12.6	706	11.6	7.3	3.0
Turkey	−6.8	1,227	−8.4	−8.7	−3.0
United Kingdom	−4.4	2,990	−2.6	−3.0	−3.0
Western Hemisphere					
Argentina	−0.1	581	−1.6	−1.5	−1.5
Brazil	−2.4	3,389	−3.4	−3.4	−3.0
Canada	−3.5	2,185	−2.5	−2.6	−2.6
Chile	−4.0	413	−2.8	−3.2	−3.0
Colombia	−3.4	526	−2.4	−2.2	−2.2
Mexico	−1.0	1,656	−1.2	−2.8	−2.8
United States	−2.9	21,101	−3.5	−3.3	−3.0
Venezuela	6.2	384	3.3	3.0	3.0

IMF = International Monetary Fund

Source: IMF (2013a); author's calculations.

overstatement of the surplus because of attribution to Swiss residents of capital income of corporations headquartered in Switzerland but mainly owned by foreign residents (see Cline and Williamson 2010, 4).[23]

The final column in table 2 reports the FEER target current account for the economy in question. Following the standard Cline-Williamson method in recent years, this target is a maximum of +3 percent of GDP and minimum of –3 percent. If the (adjusted) 2018 baseline projection is within this band, it is retained as the FEER target (for example, Thailand's projected 1.8 percent deficit is left intact as its FEER target). Otherwise the target is set at the relevant limit in the permissible ±3 percent of GDP band. As in past issues of FEERs estimates, the four major oil exporters are exempted from target changes in their current accounts, on grounds that their surpluses represent the conversion of natural resource wealth into financial asset wealth.

The list of economies with exceptionally high current account surpluses is by now familiar. The highest surpluses are once again in Singapore, at 14.3 percent of GDP (adjusted) 2018 baseline current account; Sweden (7.9 percent); and Switzerland (at 7.3 percent even after the statistical adjustment).[24] China is once again shown to reach an excessive current account surplus (4 percent of GDP by 2018), even though to a much more moderate degree than in 2006–07 when the current account surplus reached 10 percent of GDP, and despite the fact that the actual surplus in 2012 was only 2.6 percent of GDP and thus within the FEERs-permitted range. The case of China highlights an important feature of the baseline projections: They are premised on a constant real effective exchange rate. Because China has in fact had systematic increases in its real effective exchange rate in recent years, a continuation of this past policy trend would mean a lower likely outcome for the surplus in 2018 than in the IMF-based projection. The prospective surplus of 4.6 percent for Japan has been discussed and implies the need for corrective appreciation. The final excess-surplus economy, Hong Kong, has a comparable prospective surplus at 4.5 percent of GDP.

The large-deficit economies are also a familiar list. Prospective deficits are highest in Turkey (8.7 percent of GDP), New Zealand (7.7 percent), South Africa (6.1 percent), and Australia (5.5 percent). In the important case of the United States, there is only a minor excess deficit, once again a sharp contrast to the period of extreme imbalances in 2004–07, when the deficit stood at an average of 5.6 percent of GDP. The sharp decline of the dollar, by 18.6 percent in trade-weighted real effective terms from its base in 2002–03 to 2010, has played a major role in contributing to US competitiveness and curbing the excessive external deficit.[25] (A two-year lag characterizes the influence of the exchange rate on the US current account.)

External balance prospects for the euro area have shifted from an outlook of near-zero balance to one of moderate surplus, at 2.7 percent of GDP by 2018.[26] This shift reflects substantial downscaling of IMF expectations for growth (and hence import demand) for the currency area, as well as significant depreciation of the euro. Thus, in its spring WEO in 2011, the Fund projected average growth in 2011–16 at 1.76 percent annually; a year later, the projection for 2012–17 was an average of 1.15 percent annually. In the most recent WEO, the corresponding growth projection is an average of 1.16 percent annually in 2013–18 (IMF 2011, 2012a, and 2013a). The Fund's projection of the average output gap for the euro area in 2013–15 has also widened, from 0.7 percent of GDP in the spring 2011 WEO to 2.6 percent in the spring 2013 WEO. For its part, the euro depreciated by 9.6 percent in real effective terms from 2009–10 to 2012, reflecting the debt crisis albeit to a lesser extent than many had anticipated.[27] Even so, the prospective current account surplus of the euro area remains within the 3 percent limit imposed in the FEERs calculations.

CHANGES TO REACH FEERS

Table 3 reports the results of applying the SMIM model (see Cline 2008) to estimate FEERs consistent with the current account targets identified in table 2. The target change in the current account indicated in the first column of table 3 is the difference between the (adjusted) baseline 2018 estimate and the target level shown in table 2. The third column in table 3 reports the target change in the real effective exchange rate, REER, which equals the target change in the current account

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23. Other notable adjustments include reductions in the 2018 balances by more than 1 percent of GDP in Malaysia and Mexico, reflecting real effective appreciations of about 2.5 percent between the two base periods, and an increase in the surplus by about 1 percent of GDP in Korea, reflecting an effective depreciation of about 3 percent in the same period.

24. The IMF has significantly downscaled its medium-term surplus estimate for Hong Kong, from 6.5 percent of GDP in the October WEO (IMF 2012b) to 5.0 percent in the spring WEO. The change likely reflects the fact that the actual 2012 surplus was about 2 percent of GDP lower than previously projected. The surplus fell from 5.2 percent of GDP in 2011 to 2.3 percent (IMF 2013a). The decline reflected the combination of buoyant domestic demand with weak international demand associated with the euro area crisis, fiscal uncertainty in the United States, and slowdown in growth in China (ADB 2013).

25. Federal Reserve broad real exchange rate index (Federal Reserve 2013).

26. Thus, the fifth-year prospective current account for the euro area was set at 1.2 percent of GDP in the May 2012 round of FEERs estimates, and at –0.5 percent of GDP in the May 2011 round (Cline and Williamson 2012 and 2011).

27. REER index of this study. The BIS (2013) real effective index also shows a 9.6 percent decline for this period.

Table 3   Results of the simulation: Principal FEERs estimates

Country	Changes in current account as percentage of GDP		Change in REER (percent)		Dollar exchange rate		FEER-consistent dollar rate
	Target change	Change in simulation	Target change	Change in simulation	Actual April 2013	Percentage change	
Pacific							
Australia*	2.5	2.7	−11.9	−13.1	1.04	−7.8	0.96
New Zealand*	4.7	4.9	−17.3	−18.2	0.85	−15.9	0.71
Asia							
China	−1.0	−0.7	3.3	2.2	6.19	6.0	5.84
Hong Kong	−1.5	−1.2	3.0	2.4	7.76	8.7	7.14
India	0.7	0.9	−3.2	−4.1	54.4	−0.9	54.9
Indonesia	0.5	0.7	−2.3	−3.3	9,723	3.7	9,378
Japan	−1.6	−1.5	10.4	9.4	98	13.1	86
Korea	0.0	0.4	0.0	−0.9	1,121	3.5	1,083
Malaysia	−0.2	0.3	0.4	−0.7	3.05	6.5	2.86
Philippines	0.0	0.3	0.0	−1.0	41.2	6.1	38.8
Singapore	−11.3	−10.7	22.6	21.4	1.24	25.7	0.98
Taiwan	−6.2	−5.9	14.0	13.2	29.8	18.8	25.1
Thailand	0.0	0.5	0.0	−1.0	29.1	4.5	27.8
Middle East/Africa							
Israel	0.0	0.2	0.0	−0.6	3.62	1.1	3.58
Saudi Arabia	0.0	0.3	0.0	−0.7	3.75	3.6	3.62
South Africa	3.1	3.3	−12.4	−13.0	9.10	−10.0	10.1
Europe							
Czech Republic	0.0	0.2	0.0	−0.5	19.8	1.0	19.6
Euro area*	0.0	0.2	0.0	−0.8	1.30	1.0	1.32
Hungary	0.0	0.2	0.0	−0.5	229	0.9	227
Norway	0.0	0.2	0.0	−0.6	5.79	2.0	5.68
Poland	0.7	0.9	−2.1	−2.7	3.18	−1.3	3.22
Russia	0.0	0.1	0.0	−0.5	31.3	1.0	31.0
Sweden	−4.9	−4.7	12.9	12.1	6.48	13.4	5.72
Switzerland	−4.3	−4.0	9.5	9.0	0.94	10.8	0.85
Turkey	5.7	5.9	−29.3	−29.9	1.80	−28.0	2.50
United Kingdom*	0.0	0.2	−0.1	−0.8	1.53	0.9	1.55
Western Hemisphere							
Argentina	0.0	0.2	0.0	−1.2	5.15	−0.2	5.16
Brazil	0.4	0.6	−3.0	−4.3	2.00	−1.7	2.04
Canada	0.0	0.1	0.0	−0.5	1.02	0.9	1.01
Chile	0.2	0.6	−0.6	−1.7	472	1.3	466
Colombia	0.0	0.1	0.0	−0.9	1,830	0.5	1,820
Mexico	0.0	0.1	0.0	−0.5	12.2	1.0	12.1
United States	0.3	0.6	−1.5	−3.1	1.00	0.0	1.00
Venezuela	0.0	0.1	0.0	−0.7	6.29	1.1	6.22

*The currencies of these countries are expressed as dollars per currency. All other currencies are expressed as currency per dollar.

FEER = fundamental equilibrium exchange rates
REER = real effective exchange rate

Source: Author's calculations.

as a percent of GDP divided by the current account impact parameter estimated for each economy.[28] In order for the current account changes to be internationally consistent, with the sum of deficit reductions being equal to the sum of surplus reductions, the model can only approximate rather than reach exactly the target for each individual economy. The model simulation result for the change in current account is shown in the second column of the table, and the result for the simulated exchange rate change, in the fourth column. As it turns out, the model solution tends to yield current account increases that are 0.1 to 0.3 percent of GDP higher than the target changes, for excess-deficit countries and countries with no targeted change, while obtaining current account reductions that are smaller than targeted amounts by a somewhat wider range for excess-

> **Japan is now identified as a country where sizable appreciation is needed: by about 9 percent in real effective terms. Otherwise the cases requiring large appreciations or depreciations are generally the same as those identified in the previous round of estimates. ... The estimates for China and the United States once again find relatively moderate changes needed.**

surplus economies (e.g., by 0.1 percent for Japan and as much as 0.5 percent for Singapore).[29] The final three columns in the table report the corresponding changes for the bilateral exchange rate against the dollar. The percent changes in both real-effective and bilateral-dollar exchange rates are shown in figure 1, arrayed from the largest appreciations to the largest depreciations. For countries that trade heavily with the United States, the percent changes in the REER and bilaterally against the dollar are close to each other (for example, Mexico and Canada). For countries trading heavily with Asian economies that include several that would appreciate against the dollar, the bilateral exchange rate

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28. These parameters are reported in Cline and Williamson (2011). They range from approximately –0.15 to –0.5, meaning that a 10 percent appreciation (depreciation) will reduce (increase) the current account balance by 1.5 to 5 percent of GDP, with the larger impacts occurring where exports are a larger share of GDP.

29. This pattern reflects the fact that the unadjusted target changes would cause larger aggregate reductions in surpluses of excess-surplus countries than aggregate reductions in deficits of excess-deficit countries.

against the dollar changes considerably more than the real effective rate (for example, for Malaysia and Indonesia).

The patterns of needed exchange rate changes in table 3 and figure 1 are similar to those identified in the recent rounds of FEERs calculations (Cline and Williamson 2012a and 2012b). There is an important exception, however. Japan is now identified as a country where sizable appreciation is needed: by about 9 percent in real effective terms and 13 percent bilaterally against the dollar. In contrast, in the October 2012 estimates the yen was found to be at its FEER level, because at that time the currency was considerably stronger and the medium-term current account surplus was well within the 3 percent of GDP limit. The FEER-consistent value of the yen against the dollar has weakened somewhat from the earlier estimate, however, from 77 yen per dollar in the October 2012 estimate to 86 yen per dollar in the estimate based on April 2013 exchange rates. This divergence reflects the "path-dependent" nature of these calculations associated with the relatively wide range of acceptable current accounts. Namely, whereas the earlier estimate was premised on a medium-term current account surplus of 2.3 percent of GDP, the new estimate reflects a somewhat larger surplus of 3 percent, the upper limit in the approach. Even so, the new FEER-consistent estimate involves a substantial appreciation from the April level of 97.7 yen per dollar.
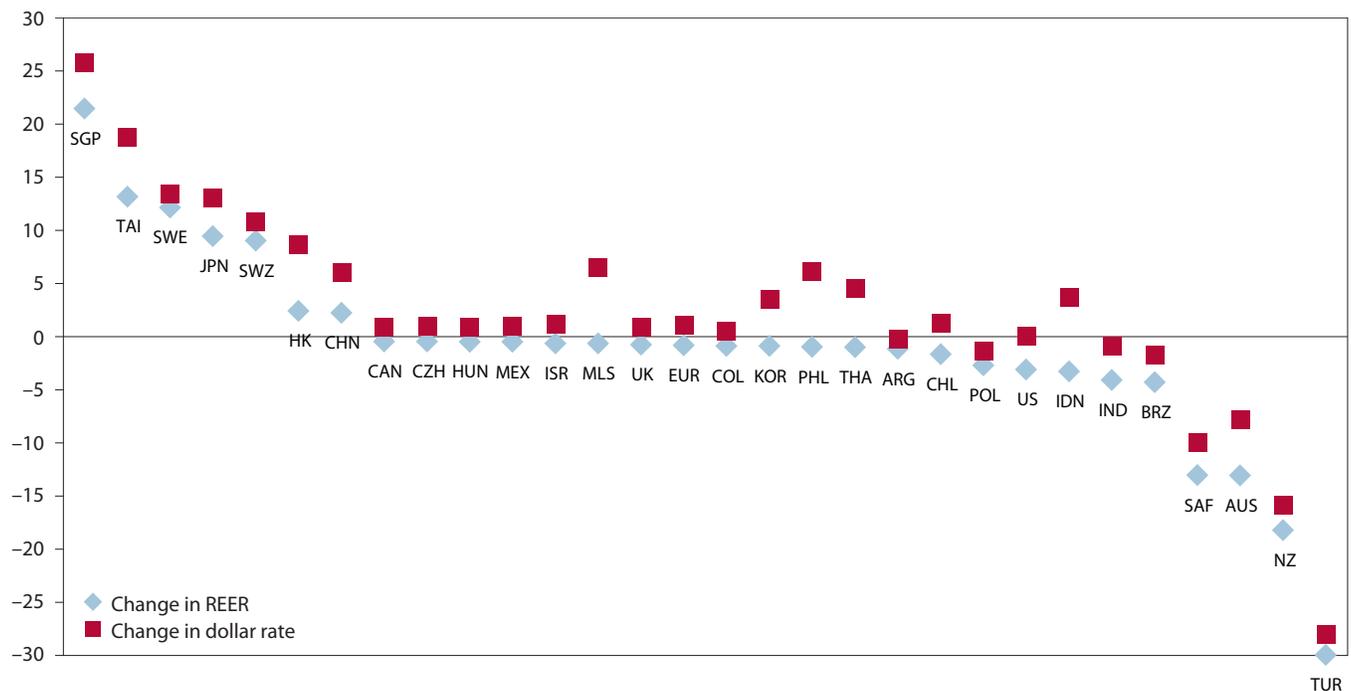
Otherwise the cases requiring large appreciations or depreciations are generally the same as those identified in the previous round of estimates. The extremes are a 21 percent REER appreciation (26 percent bilateral against the dollar) for Singapore and a 30 percent REER depreciation (28 percent against the dollar) for Turkey, the consequence of large needed adjustments in their external imbalances (with the 2018 baseline surplus reaching about 14 percent of GDP in Singapore and the baseline deficit reaching about 9 percent of GDP in Turkey). Sizable appreciations are once again called for in Taiwan (13 percent increase in the REER), Sweden (12 percent), and Switzerland (9 percent), though the appreciation needed in Hong Kong has eased (to 2.4 percent versus 7.6 percent in October). Sizable depreciations are again indicated for New Zealand (about 18 percent in the REER), Australia (13 percent), South Africa (13 percent), and Brazil (4 percent).

In the important cases of China and the United States, the estimates once again find relatively moderate changes needed (in contrast to far larger changes that were needed in 2006–09). The simulation, which is internationally consistent, calls for a 2.2 percent rise in the REER for China and 3.1 percent decline in the REER for the dollar. The FEER-consistent bilateral exchange rate of the renminbi is estimated at 5.8 yuan per dollar, close to the 5.9 level identified in the previous round

Figure 1   Changes needed to reach FEERs (percent)

SGP = Singapore, SWE = Sweden, TAI = Taiwan, HK = Hong Kong, SWZ = Switzerland, MLS = Malaysia, CHN = China, CAN = Canada, CZH = Czech Republic, HUN = Hungary, MEX = Mexico, ISR = Israel, UK = United Kingdom, EUR = Euro area, COL = Colombia, KOR = Korea, PHL = Philippines, JPN = Japan, IDN = Indonesia, THA = Thailand, CHL = Chile, ARG = Argentina, IND = India, POL = Poland, US = United States, BRZ = Brazil, SAF = South Africa, AUS = Australia, NZ = New Zealand, TUR = Turkey

FEER = fundamental equilibrium exchange rate
REER = real effective exchange rate

Source: Author's calculations.

of estimates (and about 6 percent below the actual April level of 6.2 per dollar). For its part, the euro is assigned a minimal REER depreciation of 1.0 percent only because of the model's international adding-up requirement; otherwise the euro area's prospective current account surplus is within the FEERs limits and does not require adjustment.

POLICY IMPLICATIONS

An important finding in the new FEERs estimates is that the Japanese yen has already become significantly undervalued, by an amount on the order of 10 percent (especially considering that by mid-May the currency had fallen about 4.5 percent further from the April base of the calculations). Even though a medium-term current account surplus of 4.6 percent of GDP for Japan (table 2) would not be as severe an imbalance as the 10 percent of GDP surplus reached by China in 2007 or the 6 percent of GDP deficit reached by the United States in 2006, it would represent an important source of imbalance in the world economy, occurring in the third largest national

economy at a time of persistent unemployment in other major countries.[30]

The sharp and rapid decline of the yen, combined with the prospect that Japan will have a large medium-term current account surplus as a consequence, suggests that if the yen continues much further along a downward path, the G-7 may need to consider coordinated intervention to stem the decline of the currency.[31] Japanese authorities have emphasized that their objective in quantitative easing is not to depreciate the yen but to bolster domestic demand, so they would not be in a position to object to intervention against further deprecia-

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30. Again, however, this diagnosis is premised on the judgment that the IMF's baseline projection of a current account surplus of slightly less than 2 percent of GDP by 2018 is seriously underestimated and fails to take account of the major change in the outlook caused by the sharp depreciation of the yen.

31. As this brief was being completed, on May 23, 2013 the yen strengthened from 103.2 per dollar to 101.6, in a move that coincided with a 7.3 percent decline in the Nikkei stock index in a single day (Bloomberg). It is unclear whether these movements may have marked a turning point in the market phase of continuous depreciation of the yen and appreciation in the Japanese stock market that has characterized the past six months.

tion. In its February 2013 meeting, the G-7 in effect served notice that Japan should not intervene in the exchange market to push down the yen.[32] As noted above, the G-20 issued a similar statement shortly thereafter. Even so, US authorities have been supportive of Japan's quantitative easing, and in their early May meeting the G-7 finance ministers refrained from criticizing Japan for excessive depreciation.[33]

> **If the yen continues much further along a downward path, the G-7 may need to consider coordinated intervention to stem the decline of the currency.**

The most recent coordinated intervention was also for Japan, but in the opposite direction. In mid-March 2011, following the Fukushima earthquake, the yen strengthened rapidly, and the G-7 intervened jointly to halt its increase. The yen had strengthened by 5.2 percent against the dollar (from 83 to 78.9) in just one week; following the G-7 intervention, the rate more than fully reversed course over the next two weeks (reaching 85.5; IMF 2013b; Bloomberg, accessed May 21, 2013).

Prior to the Fukushima event the G-7 had not carried out joint intervention since the coordinated effort in November 2000, to halt an excessive decline in the euro. The euro had fallen from $1.04 in October 1999 to $0.91 in April 2000, and fell further to $0.84 in October 2000. Following coordinated intervention in mid-November, by December 2000 the rate rebounded to $0.93 (IMF 2013b).

The classic coordinated intervention was the Plaza Agreement in 1985. The REER of the dollar peaked in May 1985 at an index of 125.8 (March 1973 = 100), having risen from 115.4 in May 1984 and 109.3 in May 1983 (Federal Reserve 2013). The Plaza Agreement took place in September, by which time the dollar had eased to a REER index of 122.4; by May 1986 following coordinated intervention, it had declined further to 106.7.[34]

The post-Louvre Accord period was another case of cooperative intervention, this time to curb over-correction of the

dollar in a downward direction. By February 1987, the dollar's REER index had fallen further to 101.2, and the Louvre Accord of that month began a series of interventions designed to keep the dollar-yen and dollar-deutsche mark rates within specified reference ranges (Truman 2006, 187).

Comparison of the current situation to these past episodes suggests that the yen has fallen farther and faster than the currency movements that in past episodes triggered joint intervention. Thus, in the year prior to its May 1985 peak the dollar rose in real effective terms by only 9 percent. Its cumulative rise over two years to that peak was 15.1 percent. So the real effective rate for the yen has fallen by more (about 20 percent) in only six months than the two-year rise in the dollar that triggered the Plaza Agreement. Similarly, the one-year decline in the REER of the euro prior to the November 2000 G-7 intervention amounted to only 13.8 percent (BIS 2013), again considerably smaller than what has taken place in the case of Japan in the past six months.

One reason some G-7 policymakers might be reluctant to pursue efforts to limit the further decline of the yen could be the perception that Japan especially needs export expansion to emerge from deflation and the corresponding risk of prolonged recession. But the IMF (2013a) estimates that output gaps are larger in the United States (–4.4 percent of GDP in 2013), the euro area (–3.0 percent), and the United Kingdom (–3.9 percent) than in Japan (–1.2 percent). So there is no clear basis for granting especially wide latitude to Japan to increase its current account surplus.

More broadly, it would be highly desirable for both the G-7 and the G-20 to articulate a Currency Code of Conduct to help discipline misalignments in major currencies (including those of some emerging market economies in the G-20, most notably China). Both the G-7 and G-20 have already gone part way to doing so in pronouncing specifically that countries should not "target" exchange rates, by which they implicitly mean countries should not artificially depress their currencies to gain competitive advantage.

Two additional concrete elements would be needed for a meaningful code of conduct. First, there would need to be indicative guidelines for what would constitute an excessive current account surplus. In the discussions leading up to the Seoul summit in October 2010, officials had considered but then backed away from a 4 percent of GDP benchmark.[35] Such a benchmark would be a good place to begin. (The euro area would appropriately be treated as a single economy for purposes of assessing the relevant current account; doing so would leave some room for a higher German surplus offset by deficits in some other member countries.) Second, there would need to be a gentlepersons' agreement that if an economy exceeded the

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32. The statement reads (in part): "We reaffirm that our fiscal and monetary policies have been and will remain oriented towards meeting our respective domestic objectives using domestic instruments, and that we will not target exchange rates." The statement also seemed to set the stage for action, however, if the market carried the yen too far and too fast: "We are agreed that excessive volatility and disorderly movements in exchange rates can have adverse implications for economic and financial stability. We will continue to consult closely on exchange markets and cooperate as appropriate." Bank of England (2013).

33. Christopher Ansley, "Bernanke Backs Japan's Anti-Deflation Effort as BOJ Pick Looms," *Bloomberg*, February 26, 2013; Chris Giles, "G7 Reaffirms Commitment on Currency Depreciation," *Financial Times*, May 12, 2013.

34. The corresponding BIS (2013) REER shows a broadly similar path.

35. David Lawder, "US Won't Seek 4 pct Trade Imbalance Target—Geithner," *Reuters*, November 6, 2010.

benchmark surplus, it would strictly refrain from intervening in the exchange markets to prevent its currency from rising. This second element would give operational substance to the recent G-7 and G-20 pledges to avoid the "targeting" of the exchange rate by individual countries to seek competitive advantage.

AN AGGRESSIVE-REBALANCING ALTERNATIVE

It can be argued that setting the US current account target at a deficit of 3 percent of GDP lacks ambition, especially at a time of unemployment when a narrower deficit could contribute to higher output by increasing demand. Similarly, it can be argued that allowing even a surplus of 3 percent of GDP for China is excessively lenient in terms of international rebalancing, because China is a developing economy and should be importing capital, or at least not be exporting it.

A more aggressive approach to current account targets could thus tend to focus on the presence or absence of exchange rate intervention, or on the size of the current account balance and whether it is in the direction that would normally (and normatively) be expected for a country given its advanced or emerging market status. An Aggressive Rebalancing (AR) variant of the FEERs methodology would impose a tighter standard for current account targets if the imbalance in question is in the wrong direction from the standpoint of global reallocation of capital resources from advanced to emerging market and developing countries. In this variant, *rich* countries would be expected to have a current account balance of *at least zero*, but with the 3 percent of GDP ceiling used in the standard FEERs calculations. Correspondingly, *developing and emerging market* economies would be expected to have a current account balance of *at most zero*, and again with a lower bound of –3 percent of GDP as in the standard method.[36] Once again the oil countries would be exempted and expected to have surpluses reflecting asset conversion (from physical to financial).

Table 4 arrays the 34 economies considered in this study in ascending order by purchasing power parity (PPP) per capita GDP in 2012 (IMF 2013a). The dividing line between rich and poor economies is set at New Zealand. Globally, 158 countries with PPP per capita income below New Zealand's $29,730 account for 85.2 percent of world population, 49.3 percent of

world product at purchasing power parity, but only 37.2 percent of world product at market exchange rates. The remaining 31 "rich" economies comprise the rest, meaning their share of world product at market prices (about two-thirds) is about four times as large as their share of world population (about one-sixth). [37]

Among the 34 economies shown in table 4, notable cases that qualify as high-income include Korea, Israel, Taiwan, Hong Kong, and Singapore, with Singapore measured as having the highest per capita PPP GDP of all. In setting the Aggressive Rebalancing current account targets, all of the emerging market

> **In an Aggressive Rebalancing variant of the FEERs, limiting rich country balances to at least zero and emerging market economy balances to at most zero ... The United States would need a 15.9 percent depreciation of the REER ... China would need an effective appreciation of about 13 percent.**

economies (of which Czech Republic has the highest per capita income) are given current account targets that: (1) cannot be lower than –3 percent of GDP; (2) cannot be higher than zero; and (3) are otherwise simply the baseline (adjusted) 2018 levels. All of the high income economies are given current account targets that: (1) cannot be higher than +3 percent of GDP; (2) cannot be lower than zero; and (3) are otherwise set at the baseline 2018 levels.

These AR limits leave the current account targets unchanged for 26 of the 34 economies. Three poor economies now have changed targets eliminating rather than curbing their surpluses: China, Malaysia, and the Philippines. Among the rich countries, there is a uniquely English-speaking club of five economies that all are constrained to eliminate their deficits: Australia, New Zealand, the United Kingdom, Canada, and the United States. Once again a familiar list of high-surplus economies must scale back surpluses to a ceiling of 3 percent, including Hong Kong, Singapore, Sweden, Switzerland, and Taiwan (as well as Japan in the new baseline).

Table 5 reports the target changes in current accounts, real effective exchange rates, and corresponding results for bilateral exchange rates against the dollar when the SMIM model is applied to the Aggressive Rebalancing set of current account

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36. Some might object that these goals would deprive poor countries of the opportunity to grow through export-led growth. But the classic export-led growth of economies such as Korea involved rapid expansion of both exports and imports, with either persistent current account deficits or approximate balance rather than surpluses. Thus, from 1980 through 1997, Korea had a current account deficit in 13 of 18 years, with a simple average balance of –0.06 percent of GDP (IMF 2013a). The more recent image of growth through ever-rising trade surpluses represents mercantilism rather than export-led growth, and has mainly reflected a somewhat aberrant period in which countries sought to build large reserves to self-insure against external shocks following the late 1990s East Asian crisis.

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37. Note, however, that a few euro area countries are included in the "poor" group in this rough calculation, as their PPP per capita incomes are moderately lower than that of New Zealand (including Greece and Portugal).

Table 4   Aggressive-rebalancing current account (CA) targets

Country	PPP per capita income (dollars)	Adjusted 2018 CA (percent)	Target CA (percent)
Emerging market:			
India	3,830	−3.7	−3.0
Philippines	4,430	1.2	0.0
Indonesia	4,977	−3.5	−3.0
China	9,162	4.0	0.0
Thailand	10,126	−1.8	−1.8
Colombia	10,792	−2.2	−2.2
South Africa	11,375	−6.1	−3.0
Brazil	11,875	−3.4	−3.0
Venezuela	13,616	3.0	3.0
Turkey	15,001	−8.7	−3.0
Mexico	15,312	−2.8	−2.8
Malaysia	16,922	3.2	0.0
Russia	17,709	0.4	0.4
Argentina	18,112	−1.5	−1.5
Chile	18,419	−3.2	−3.0
Hungary	19,638	−1.1	−1.1
Poland	20,592	−3.7	−3.0
Czech Republic	27,191	−1.1	−1.1
Advanced:			
New Zealand	29,730	−7.7	0.0
Saudi Arabia	31,275	10.6	10.6
Korea	32,272	2.2	2.2
Israel	32,312	1.4	1.4
Euro area	34,117	2.7	2.7
Japan	36,266	4.6	3.0
United Kingdom	36,941	−3.0	0.0
Taiwan	38,749	9.2	3.0
Sweden	41,191	7.9	3.0
Australia	42,640	−5.5	0.0
Canada	42,734	−2.6	0.0
Switzerland	45,418	7.3	3.0
United States	49,922	−3.3	0.0
Hong Kong	51,494	4.5	3.0
Norway	55,009	8.9	8.9
Singapore	60,410	14.3	3.0

PPP = purchasing power parity

Source: IMF (2013a) and author's calculations.

Table 5   Simulation results for the aggressive rebalancing scenario

| Country | Changes in current account as percentage of GDP | | Change in REER (percent) | | Dollar exchange rate | | FEER(AR)-consistent dollar rate |
	Target change	Change in simulation	Target change	Change in simulation	Actual April 2013	Percentage change	
Pacific							
Australia*	5.5	5.5	−26.5	−26.6	1.04	−4.7	0.99
New Zealand*	7.7	7.7	−28.3	−28.3	0.85	−12.8	0.74
Asia							
China	−4.0	−4.0	13.2	13.2	6.19	31.0	4.72
Hong Kong	−1.5	−1.5	3.0	3.0	7.76	28.4	6.05
India	0.7	0.7	−3.2	−3.2	54.4	15.7	47.0
Indonesia	0.5	0.5	−2.3	−2.3	9,723	21.1	8,032
Japan	−1.6	−1.6	10.4	10.4	97.7	29.6	75.4
Korea	0.0	0.0	0.0	0.0	1,121	20.6	930
Malaysia	−3.2	−3.2	6.4	6.3	3.05	29.3	2.36
Philippines	−1.2	−1.2	3.9	3.9	41.2	26.4	32.6
Singapore	−11.3	−11.3	22.6	22.6	1.24	43.4	0.86
Taiwan	−6.2	−6.2	14.0	14.0	29.8	36.2	21.9
Thailand	0.0	0.0	0.0	0.0	29.1	21.6	23.9
Middle East/Africa							
Israel	0.0	0.0	0.0	0.0	3.62	14.7	3.16
Saudi Arabia	0.0	0.0	0.0	0.0	3.75	19.6	3.13
South Africa	3.1	3.1	−12.4	−12.4	9.10	6.2	8.57
Europe							
Czech Republic	0.0	0.0	0.0	0.0	19.8	17.2	16.9
Euro area*	0.0	0.0	0.0	0.0	1.30	16.9	1.52
Hungary	0.0	0.0	0.0	0.0	229	17.2	196
Norway	0.0	0.0	0.0	0.0	5.79	15.3	5.02
Poland	0.7	0.7	−2.1	−2.2	3.18	14.8	2.77
Russia	0.0	0.0	0.0	0.0	31.3	18.0	26.5
Sweden	−4.9	−4.9	12.9	12.9	6.48	28.7	5.04
Switzerland	−4.3	−4.3	9.5	9.5	0.94	25.7	0.75
Turkey	5.7	5.8	−29.3	−29.3	1.80	−11.9	2.04
United Kingdom*	3.0	3.0	−11.7	−11.7	1.53	4.6	1.60
Western Hemisphere							
Argentina	0.0	0.0	0.0	0.0	5.15	15.7	4.45
Brazil	0.4	0.4	−3.0	−3.1	2.00	14.5	1.75
Canada	2.6	2.6	−9.8	−9.8	1.02	−2.2	1.04
Chile	0.2	0.2	−0.6	−0.7	472	16.9	404
Colombia	0.0	0.0	0.0	0.0	1,830	11.4	1,642
Mexico	0.0	0.0	0.0	0.0	12.2	7.5	11.3
United States	3.3	3.3	−15.8	−15.9	1.00	0.0	1.00
Venezuela	0.0	0.0	0.0	0.0	6.29	12.9	5.57

*The currencies of these countries are expressed as dollars per currency. All other currencies are expressed as currency per dollar.
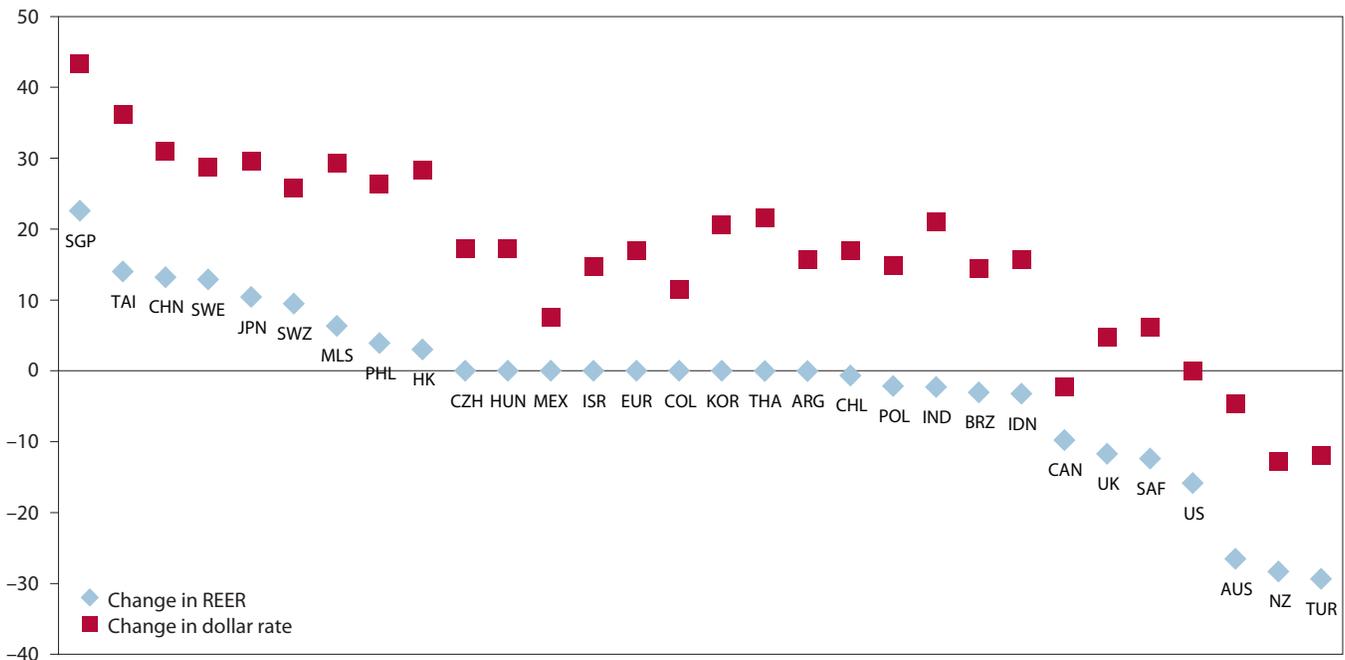
AR = aggressive rebalancing
FEER = fundamental equilibrium exchange rates
REER = real effective exchange rate

Source: Author's calculations.

Figure 2   Changes needed to reach FEERs (AR), aggressive rebalancing scenario

Economies: see figure 1

AR = aggressive rebalancing
FEER = fundamental equilibrium exchange rates
REER = real effective exchange rate

Source: Author's calculations.

targets. This time the real effective depreciations required are far larger for the (English-speaking) rich countries previously allowed to remain in deficits as large as 3 percent of GDP but now required to achieve current account balance. The United States needs a 15.9 percent depreciation of the REER to eliminate the current account deficit. Canada has an effective depreciation of about 10 percent, instead of essentially no change. The United Kingdom needs an effective depreciation of about 12 percent versus close to zero before. The Philippines would need an effective appreciation of 4 percent instead of zero. And the already sizable needed depreciations previously identified are increased further for Australia (from 13 percent to 27 percent) and New Zealand (from 18 percent to 28 percent).

For China, the Aggressive Rebalancing simulation bringing its current account surplus to zero requires an effective appreciation of about 13 percent, or about 10 percentage points higher than in the main variant. Malaysia's needed appreciation also rises (from near zero to about 6 percent).

There are more dramatic implications for changes in bilateral exchange rates against the dollar. The need for a 16 percent real effective depreciation of the dollar on the one hand and a 13 percent real effective appreciation of the renminbi on the other means that the typical economy would appreciate substantially against the dollar just to maintain its real effective rate unchanged. The needed bilateral appreciation is especially high in Asia, where trading shares are high with China and other Asian economies, but more moderate in Latin America, where (especially for Mexico) the trade share with the United States is higher. In Japan, the Aggressive Rebalancing variant implies a 30 percent increase in the bilateral exchange rate against the dollar, even though the target change in the real effective exchange rate remains unchanged at 10 percent. China's currency rises 31 percent bilaterally against the dollar to reach the Aggressive Rebalancing FEER-consistent level. Even Brazil needs a bilateral appreciation against the dollar by about 15 percent in the AR variant, despite achieving a real effective depreciation of 3 percent. Figure 2 shows the REER and bilateral exchange rate changes in the simulation results for Aggressive Rebalancing.

The purpose of the FEER-AR calculations is not to suggest that they should supplant the main FEERs estimates, but to underscore the fact that the rebalancing aspirations of the main method are more moderate than others that might reasonably be justified. The more aggressive targets are considered in the

spirit of the recent arguments of my colleagues C. Fred Bergsten (2013) and Joseph E. Gagnon (Bergsten and Gagnon 2012). They argue that large current account surpluses of many countries pursuing exchange rate intervention and reserves buildup constitute a major distortion in the international economy, and that an end to such interventions would bring a major reduction in US current account deficits. Bergsten (2013) goes considerably further than the Currency Code of Conduct suggested here, raising the possibility of countervailing currency intervention against surplus countries intervening to keep their currencies from rising, and even the imposition of trade penalties in light of the World Trade Organization (WTO) commitment that countries not "frustrate the intent" of their trade obligations through exchange rate measures (Article XV).[38] However, it would seem preferable to begin with a more cooperative, if less ambitious, approach along the lines of a G-7 and G-20 currency code of conduct as suggested above.

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38. See Cline (2005, 279).

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