Peterson Institute for International Economics

Policy Brief

NUMBER PB10-26 NOVEMBER 2010

Currency Wars?

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A widespread currency war is in prospect. The term was first introduced by Guido Mantega, the finance minster of Brazil. He envisaged the International Monetary Fund (IMF) developing an index that measures whether currencies are held artificially low to boost exports (popularly referred to as "currency manipulation").[1] If that IMF exercise did not lead to an easing of such exchange market intervention, he suggested that an undervalued exchange rate could eventually be considered a commercial subsidy.

Many countries, including Brazil, China, India, Indonesia, Israel, Japan, Korea, Malaysia, the Philippines, Singapore, South Africa, Switzerland, Taiwan, and Thailand,[2] are reported recently to have engaged in exchange market intervention and/or capital controls to curb currency appreciation. There are fears that currency appreciation may be worsened by the additional quantitative easing (the so-called QE2) in the United States. Because many countries are simultaneously seeking to improve their trade position, either (or both) because they regard themselves as short of aggregate demand or because their existing current account position is weaker than they would wish, many countries are seeking a more competitive exchange rate. The laws of mathematics mean that some must be disappointed: A weaker exchange rate of one country implies a stronger rate of some other country or countries. The questions are, Who is to accept this outcome and how will it be decided who that is to be?

The aim of this policy brief is to illuminate how such issues should be determined. The first section of this paper considers where the world is now and how it got there. The second section updates information on the levels of effective exchange rates in comparison with the fundamental equilibrium exchange rate (FEER) targets identified in our most recent set of estimates (Cline and Williamson 2010). This section then examines the pattern of exchange rate intervention and considers where it is consistent with, and contradictory to, systemically benign intervention in view of present departures from FEERs. The third section seeks to broaden the analysis by explaining the relevance of a widely accepted economic theory that asserts that countries[3] should pursue macroeconomic policies for both internal and external balance. The fourth section examines the nature of needed adjustments if that theory is accepted. The final section draws out the policy implications for how to rebalance global demand, using our own estimates of where exchange rates should be, as well as estimates of the strength of demand in different parts of the world.

THE WORLD OF TODAY

The postwar international monetary system was designed at Bretton Woods. It involved administered exchange rates, with changes permitted only with IMF approval and when a country could no longer achieve reasonable internal and external balance at its existing exchange rate. The incentive to adjust was provided by the reserve stock, with too few reserves signifying a need to restrain demand and/or devalue

1. According to a report in the Brazilian newspaper *O Globo.*

2. All these countries have been mentioned in press references; see appendix B.

3. The word "countries" is used to signify areas with a common currency, although both in Europe and East Asia these are not always the same as countries.

and the United States given an obligation to maintain the gold convertibility of the dollar in return for the dollar's reserve role. There were those who doubted that the dollar could be devalued against other currencies because other countries would match any dollar devaluation against gold, but legally the IMF could have forbidden this in fulfilling its duty of supervising the exchange rate system.

The laws of mathematics mean that some must be disappointed: A weaker exchange rate of one country implies a stronger rate of some other country or countries.

The Bretton Woods system collapsed when the United States accepted that it could no longer maintain the gold convertibility of the dollar in August 1971. Shortly after that the then-major powers all started to float, but many of the emerging-market economies continued to peg to the dollar. But they did this without effective surveillance by the IMF, which had formerly been responsible for approving any administered change in exchange rate but which now had to operate under a set of rules that said that any exchange rate regime was permissible except pegging to gold (which no country was foolish enough to consider anyway). True, the United States insisted on inserting a requirement in the guidelines for floating that countries with floating currencies consider the interests of the country whose currency they planned to use when intervening, but it was not clear that this applied to currencies that pegged. In any event it has not prevented the proprietors of those currencies from viewing the value of their peg as a sovereign decision in which other countries, including the issuers of their reserve currencies, are not entitled to interfere. To the extent that they did not regularly revalue to reflect the Balassa-Samuelson presumption that a fast-growing country needs an appreciating real exchange rate to avoid undervaluation from developing (which was reinforced by a desire for current account surpluses to "self-insure" following the East Asian crisis), they became undervalued.

UPDATED EFFECTIVE EXCHANGE RATES AND PATTERNS OF INTERVENTION

It was in this environment of an exchange rate free-for-all that we have for the past two years been calculating and releasing estimates of FEERs. The most recent of these was released in June (Cline and Williamson 2010) based on exchange rates as of May 2010 and medium-term current account projections in the April issue of the IMF's *World Economic Outlook* (WEO). The dollar had at that time been buoyed by a safe haven effect as a consequence of market concern about European sovereign debt. The relaxation of this concern after May set the stage for an easing in the dollar. Subsequent doubts about the robustness of the US recovery and, especially, expectations prompted by the prospect of new US monetary easing (the second dose of quantitative easing, dubbed QE2), have further contributed to a substantial easing in the dollar against most other floating currencies by October (table 1).[4]

We have not felt it necessary to calculate a new set of FEERs, since the October issue of the WEO did not make major changes in its projections of medium-run current account balances for any country except Singapore (see the comparisons in appendix table A.1), and inflation in almost every case is low. Table 1 therefore reports merely the May and October levels of real effective exchange rate indexes for the 30 countries for which we have been calculating FEERs;[5] the changes needed to reach equilibrium as calculated in May; and the new set of changes needed to reach equilibrium as of October, assuming that the FEER is unchanged. The final column states whether we judge a currency to be overvalued (O), undervalued (U), or within 2.5 percent of equilibrium (E). Appendix table A.2 reports the corresponding levels of FEER-consistent exchange rates against the dollar. (For purposes of table 1, in October the dollar met the criterion for equilibrium (E), being only 2.5 percent overvalued.)

For the United States, which was estimated in our June policy brief to be in need of a devaluation of almost 8 percent, there has been a reduction in the REER by over 5 percent, leaving only a marginal further change until it reaches equilibrium.[6] In contrast, the Chinese renminbi is even further from equilibrium than in May because its ballyhooed appreciation against the dollar since its "flexibilization" in June has not even balanced its depreciation against most other

4. From the end of May to the end of August, the dollar fell by 1.6 percent against major currencies on the Federal Reserve's broad nominal index (Federal Reserve 2010). The timing of the steep subsequent decline by 5.3 percent from end-August to October 14 suggests a major role for QE2 expectations following the Jackson Hole speech of Federal Reserve Chairman Ben Bernanke in late August.

5. The real effective exchange rate indexes presented here have a base of the average for 2007 as 100 and apply the matrix of trade weights reported in Cline (2008). For each country, changes in partner exchange rates (after taking account of the difference between country and partner inflation) are weighted by the share of the partner country in imports and exports of the country in question.

6. However, some may wonder whether the IMF's projection of the US current account deficit on which that estimate was based—which foresaw a reduction in the US deficit in prospect, followed by a very modest rise out to 2015—may not have been unrealistically small.

Table 1 Changes in effective exchange rates and extent of misalignment, May–October 2010

Country	May 2010	Percent change needed	October 2010	Percent change needed	Misalignment October 2010
Argentina	91.4	–2.9	87.2	1.8	E
Australia	104.0	–16.1	111.7	–21.9	O
Brazil	119.4	–5.9	122.6	–8.3	O
Canada	101.9	–0.6	103.0	–1.6	E
Chile	102.0	–2.6	107.1	–7.2	O
China	113.9	13.5	110.2	17.3	U
Colombia	112.2	–2.3	117.3	–6.6	O
Czech Republic	110.6	–1.1	115.9	–5.6	O
Euro area	95.1	–2.5	98.1	–5.5	O
Hong Kong	95.6	6.8	90.8	12.5	U
Hungary	97.7	–1.1	99.7	–3.1	O
India	112.0	–1.8	114.0	–3.6	O
Indonesia	106.0	–2.0	105.4	–1.4	E
Israel	116.3	–1.4	116.6	–1.7	E
Japan	118.8	–2.0	126.9	–8.2	O
Korea	78.6	–1.8	78.7	–1.9	E
Malaysia	102.5	12.5	102.1	13.0	U
Mexico	93.2	–0.8	94.7	–2.4	E
New Zealand	94.3	–24.7	94.8	–25.0	O
Philippines	107.2	–1.7	107.1	–1.6	E
Poland	96.3	–1.3	100.1	–5.0	O
Singapore	108.7	32.0	111.4	28.9	U
South Africa	109.1	–15.7	113.3	–18.8	O
Sweden	92.7	8.3	98.7	1.7	E
Switzerland	110.3	11.5	116.7	5.4	U
Taiwan	95.7	8.0	94.6	9.4	U
Thailand	102.6	–2.0	104.6	–3.9	O
Turkey	106.3	–11.7	109.1	–14.1	O
United Kingdom	79.1	–1.4	79.2	–1.4	E
United States	99.1	–7.8	93.8	–2.5	E

Source: Columns 1 and 3 are Cline's index of real effective exchange rates (REERs) with index 2007 = 100, and columns 2 and 4 are percentage changes in REERs needed to reach estimated fundamental equilibrium exchange rates. Column 5 classifies a country as overvalued (O) if it was more than 2.5 percent above the estimated equilibrium in October 2010, U if it was more than 2.5 percent below, and E if it was within 2.5 percent of equilibrium.

currencies. The set of other East Asian currencies that were severely undervalued in May have not changed greatly: For Malaysia the desirable correction is approximately the same as before, for Hong Kong and Taiwan it is somewhat greater, and for Singapore it is somewhat less. The euro and the yen, along with all other floating currencies, except the Philippine peso and the New Taiwan dollar, have appreciated. Quite a number, including the euro and yen, have become overvalued. A number that were seriously overvalued before, like the Australian and New Zealand dollars, the South African rand, and the Brazilian real, have become even more overvalued. The only good news, apart from the reduction in the dollar's overvaluation, is elimination of the Swedish undervaluation and a reduction in the Swiss undervaluation.

A straightforward metric for judging whether intervention can be regarded as antisocial or, instead, a warranted effort to prevent widening of misalignments is to consider the pattern of exchange rate interventions in relationship to the level of

Table 2 Country categorization by currency under- (over-) valuation in October 2010 and exchange rate intervention in recent months

	Undervalued	Approximate equilibrium	Overvalued
Intervened to prevent appreciation	China, Hong Kong,[1] Malaysia, Singapore, Switzerland, Taiwan	Argentina, Indonesia, Israel, Korea, Philippines	Brazil, India, Japan, South Africa, Thailand, Turkey
No apparent intervention		Canada, Mexico, Sweden, United Kingdom, United States	Australia, Chile, Colombia, Czech Republic, euro area, Hungary, New Zealand, Poland
Intervened to prevent depreciation	…	…	…

1. Because Hong Kong's currency board pegs the exchange rate to the dollar, and because Hong Kong has been running large current account surpluses, the economy is automatically considered to be in the category of intervention to prevent appreciation.

Source: See appendix B.

the currencies in question vis-à-vis their FEER levels. In short, if a currency is substantially undervalued and the country is aggressively engaging in intervention to prevent appreciation, it is reasonable to judge that its intervention is unjustifiable. If instead the country is already overvalued relative to its FEER, currency intervention to prevent further appreciation may be seen as benign and consistent with cooperative international behavior.

Countries that are already overvalued on an effective basis—primarily floating emerging-market economies, but also Australia and New Zealand—should not be condemned for resisting further appreciation.

Table 2 draws upon recent press reports to identify countries by three categories of exchange rate intervention: purchase of foreign currency to prevent appreciation; broad absence of intervention activity; and sale of foreign exchange to prevent depreciation. In addition, it classifies countries according to three categories of exchange rate position relative to the FEER target: undervaluation, approximate equilibrium, and overvaluation. The three columns correspond respectively to identification as U, E, and O in the final column of table 1.

It is clear in the table that none of the countries has been engaging in major efforts to prevent depreciation through the selling of reserves. Thus, there are no entries in the third row of the table. It is equally clear, however, that a large number of countries have been engaged in intervention to prevent appreciation. Seventeen economies are located in the first row of the table, more than half of the economies examined. But the three separate columns make it clear that whereas a number of these economies have some justification for intervening, only a handful of high-surplus economies are intervening in a fashion that is perverse for the reduction of international imbalances. These are the principal economies with major undervaluations of currencies (and correspondingly large excesses of current account surpluses over targets from international norms) that are nonetheless preventing market correction of currency valuation. China, Hong Kong, Malaysia, Singapore, Switzerland, and Taiwan are in this category.

In contrast, at the opposite extreme are countries with already overvalued currencies that are intervening in an effort to prevent them from becoming even more overvalued. Brazil and Japan, two of the most prominent countries in the recent international debate about currency wars, are in this position. Their intervention should be viewed as benign because it prevents still greater distortions in international imbalances. One might also regard as benign interventions to prevent further appreciation by a number of economies that are near their FEER. Korea is an important example in this category, because rather than pursuing unfair competition against Japan through competitive depreciation (as some Japanese officials appear to believe), the country is merely seeking to prevent appreciation that boosts the currency well above the equilibrium level.[7]

The second row of table 2 reports several countries that appear to have refrained from currency market intervention. These include countries that are highly overvalued (Australia, New Zealand), as well as moderately overvalued (the eurozone), in addition to several important countries that are at approximate exchange rate equilibrium as measured by FEERs (including Canada, the United Kingdom, and the United States).

7. Japanese Finance Minister Yoshihiko Noda has stated that Korea's leadership as current chair of the G-20 will be "seriously questioned" because of its intervention to prevent appreciation of the won (News Center 2010).

The broad policy thrust of table 2 is the diagnosis that although many countries have been intervening, most of them are in the category of pursuing warranted intervention to prevent the exchange rate from being pushed further away from a level consistent with external balance (as judged by our limits of ±3 percent of GDP for the current account in identifying FEERs; see Cline and Williamson 2010). The key exceptions are the six major undervalued currencies in the cell in row 1 and column 1. It is quite wrong to condemn countries for resisting appreciation irrespective of their situation. Any agreement reached at Seoul to prevent an exchange rate war should be based on a distinction between countries with overvalued and undervalued currencies and should be designed to seek appreciation of the latter but not to debar the former from actions to prevent a further magnification of disequilibrium.

We are Meadean in the sense that we think it important to be reasonably close to both IB [internal balance] and EB [external balance], and that this requires appropriate levels of both fiscal-monetary policy and exchange rates.

Countries that are already overvalued on an effective basis—primarily floating emerging-market economies, but also Australia and New Zealand—should not be condemned for resisting further appreciation. The question is sometimes asked as to why a country with adequate reserves does not simply let the currency appreciate. The usual answer is that many countries, especially those not fully developed, desire to protect their export sector (so as to avoid succumbing to Dutch disease). This seems to us to be a legitimate reason.

THE IMPLICATIONS OF MEADEAN THEORY

The G-20 is reported to be concerned about the prospect of a currency war. At the same time, it is to be hoped that any resolution will be based on principles, not power. We aim in what follows to elucidate what we regard as the principles that should underpin any G-20 resolution of this question. Presumably some economists do not accept the framework that we find natural for discussing this issue. They are welcome to lay out what they regard as a competitive framework, so that it can be compared and judged.

The framework on which we base our analysis is the one presented by James Meade (1951), who postulated that each country has two objectives of its macroeconomic policy, which he described as internal balance (IB) and external balance (EB). IB was in Meade's day thought of as a full employment level of output. A bit later, when the Phillips curve had come along, it was described as the optimal combination of employment and inflation. A little later still, after the expectations revolution had convinced most of the profession that an attempt to hold unemployment below the natural rate implied ever-accelerating inflation, IB was conceived as having unemployment at the natural rate. To those who recognize that there are dynamic questions involved, IB is today thought of as the level of demand implied by a Taylor Rule.[8]

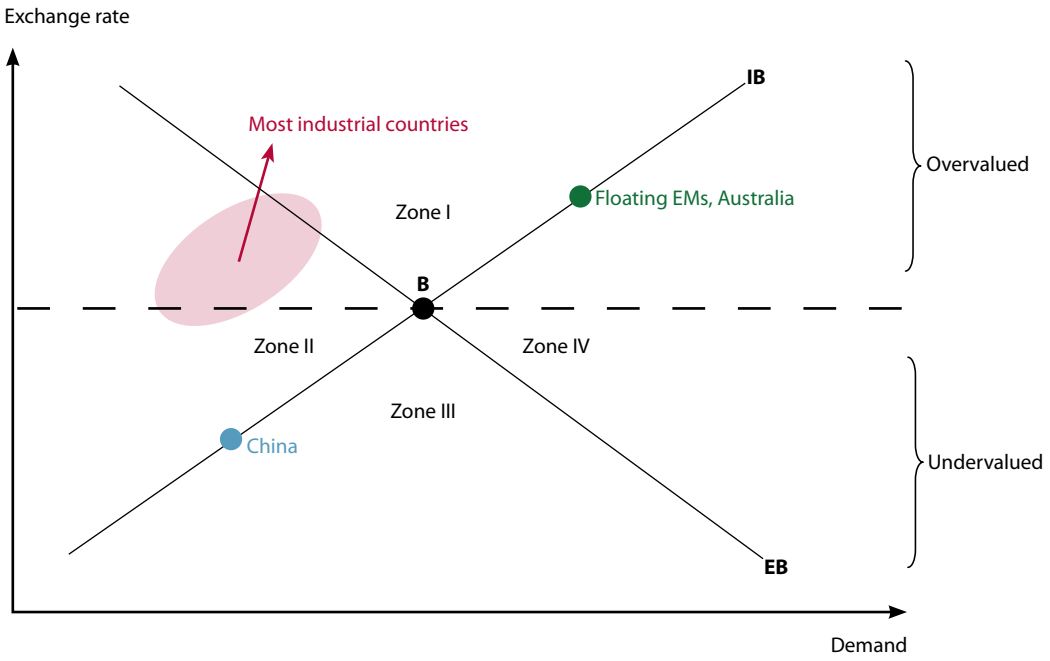
EB was in Meade's day thought of as a zero change in reserves, where the current account balance matched the essentially exogenous inflow or outflow of capital. This has subsequently been generalized in two ways: by recognizing that the flow of capital is influenced by one of the same variables that helps determine the current account, namely the (relative) rate of interest, and by recognizing that the policy objective may be a secular increase in the reserve level (to reflect growth and/or for self-insurance motives). Today most industrial countries and (arguably) also many emerging-market economies can essentially borrow or lend unlimited sums, but a concern to maintain intertemporal solvency dictates, or should dictate, that they limit current account deficits to 3 or 4 percent of GDP. EB for a deficit country can be thought of as maintaining the current account deficit at less than this level.

That still leaves the issue of defining EB for a surplus country. There are two approaches. One, which we have adopted in the past, is to lay down rules that are in some sense symmetrical to those for deficit countries and hope that these will result in a roughly balanced outcome. The alternative is to add up the deficits implied by the rules specified and recognize that this is the sum available for surpluses. The question then becomes how that surplus should be distributed. The alternatives seem to be: negotiation (in the G-20? in the IMF?); cutting down the peak surpluses (presumably relative to GDP) to a uniform level; cutting down all surpluses (or perhaps all surpluses above a certain level) by an equal proportion; and some mix of these.

The part of Meade's analysis that is widely remembered is how to use available policy tools to achieve the two targets of

8. The Taylor Rule states that the federal funds rate is set at the target real interest rate (k) plus the recent inflation rate (p), plus a coefficient (a) times the percent by which real GDP exceeds its trend level, plus a coefficient (b) times the amount by which the recent inflation rate exceeds the target inflation rate (π). He found that for 1987–92, a good fit was obtained with $k = \pi =$ 2 percent and $a = b = 0.5$. Taylor (1993, 202).

Figure 1



EM = emerging-market economies

Source: The analysis of Meade (1951) as portrayed in Swan (1960).

IB and EB. Meade argued in terms of how to manage exchange rates, along with fiscal-monetary policy, to that end. A significant generalization was achieved by Harry Johnson (1961). He showed that one needed both an expenditure-switching and an expenditure-changing instrument to achieve both objectives simultaneously.[9] Expenditure-switching policies are those which leave the total level of demand unchanged but redirect it from country A's goods to those produced by country B. This is true for exchange rate changes, but it is also true of changes in the level of protection; these are ruled out as undesirable not because they could not serve the function of changing the direction of expenditure, but because in doing so they would cause a loss of real (world) income. Conversely, expenditure-changing policies are those that have no first-order effects on where money is spent but influence instead the overall level of spending, such as fiscal policy and monetary policy, but also (insofar as it is a policy variable) the level of credit expansion,

We are Meadean in the sense that we think it important to be reasonably close to both IB and EB, and that this requires appropriate levels of both fiscal-monetary policy and exchange rates. Specifically, as illustrated in figure 1, a country may be in four zones of disequilibrium (or in a borderline situation where it satisfies either the IB or EB requirement, or conceivably at the bliss point B where it satisfies both). If it is in zone I, it needs to devalue; whether it needs to expand or contract demand is ambiguous. In zone II, it needs to expand demand, though whether it needs to devalue, revalue, or neither is ambiguous. In zone III it needs to revalue for the sake of approaching both IB and EB (in the old literature, this was referred to as a nondilemma case, because with regard to exchange rate policy a country did not have to choose between satisfying external and internal objectives, the same policy could advance both). In zone IV it needs to contract demand but faces a dilemma with regard to exchange rate policy, where it would need to devalue to approach EB and revalue to approach IB.

THE PRESENT SITUATION

The world situation can be translated into where the different countries are in figure 1. Note that "the" exchange rate portrayed there is the effective exchange rate shown in table 1 and column 1 of table 3, rather than the dollar rate whose disequilibrium is shown in column 2,[10] since it is the effective

9. This fact has not prevented critics of the use of exchange rate policy from asserting that to advocate an exchange rate change is to claim that no other policy change is required.

10. As noted, the FEER-consistent dollar rates are derived in appendix table A.2.

Table 3 Estimated overvaluations as of October 2010

Country	Effective overvaluation	Dollar overvaluation*
Argentina	–1.8	1.1
Australia	21.9	17.5
Brazil	8.3	9.0
Canada	1.6	1.2
Chile	7.2	7.7
China	–17.3	–19.7
Colombia	6.6	8.5
Czech Republic	5.6	10.8
Euro area	5.5	5.7
Hong Kong	–12.5	–22.0
Hungary	3.1	7.8
India	3.6	–0.7
Indonesia	1.4	–9.2
Israel	1.7	1.4
Japan	8.2	2.7
Korea	1.9	–4.2
Malaysia	–13.0	–22.1
Mexico	2.4	2.8
New Zealand	25.0	25.5
Philippines	1.6	–4.5
Poland	5.0	9.5
Singapore	–28.9	–32.9
South Africa	18.8	19.2
Sweden	–1.7	2.2
Switzerland	–5.4	0.1
Taiwan	–9.4	–16.7
Thailand	3.9	–1.9
Turkey	14.1	16.2
United Kingdom	1.4	4.2
United States	2.5	0

Note: Percent change in the dollar rate to reach the FEER-consistent dollar rate, with sign reversed.

rate that is the relevant determinant of a country's macroeconomic situation.

Internal balance was calculated as follows. The IMF includes a measure of excess capacity for some industrial countries in its WEO and the OECD publishes estimates for its member countries (see appendix table A.3); the figures for 2011 are averaged when both are available, or just the OECD figure is taken when there is no WEO number. The country is designated as having excess capacity if its (averaged) output gap (negative) exceeds 1 percent of GDP. For the remaining countries, the IMF's projection of 2015 growth was taken to be its measure of trend growth. It was assumed that capacity grew at 80 percent of this trend rate over the five years 2007–11, with the reduction designed to take account of lesser capital formation during the Great Recession. If actual growth over this period resulted in 2011 output more than 5 percent short of the level indicated by this potential growth rate, the country was declared to be suffering excess capacity; conversely, where 2011 output was larger than indicated by potential, or less than 5 percent short, it was assumed to be in or close to internal balance.

Since most industrial countries have a shortage of demand, they lie to the left of IB in figure 1. Not only is aggregate demand less than desired, but the opportunities of fiscal expansion are severely circumscribed by the bond market and/or concerns about fiscal sustainability (and in some cases by ideological beliefs). The United States and possibly also the United Kingdom will proceed with further monetary expansion, but the chances of this having much impact on demand other than via the exchange rate do not appear high. The fact is that the effective exchange rates of most industrial countries, with the notable exception of Australia and New Zealand, are not far from equilibrium, with the effective overvaluations of most being largely explained by the continued undervaluation of China and its East Asian satellites. Australia is unusual among industrial countries in being on the IB curve. Since Australia is overvalued it is to the right and above B. The only industrial-country currency that we judge as undervalued is that of Switzerland.[11]

A second group of countries is those emerging-market economies and developing countries with floating currencies. Most have strong (but not excessive) demand, which means that they lie on the IB curve. The shortages from which they still suffer are supply-side, and would not be alleviated by an increase in demand. The fact that most are overvalued means that they lie above and to the right of B, like Australia. Many are concerned to protect their export sectors, since they like export-led growth.

11. Note, however, that according to the *Economist*'s latest Big Mac index (published in their issue of October 16) it is the most overvalued currency. The difference depends upon the definition used. Because Switzerland is a large external creditor, it needs to revalue in order to reach EB (hence Cline-Williamson); because it is already a costly country (as anyone who has stayed in a Swiss hotel recently can confirm), it would need to devalue in order to achieve comparable costs (Big Mac). Since the relevant question is achieving EB and IB, we put Switzerland below the horizontal line through B. To do otherwise suggests that it is just fine for a country that is already a substantial creditor to continue increasing its assets/GDP ratio. More generally, we do not consider purchasing power parity to be a useful basis for judging over- or undervaluation for purposes of external imbalances (see Cline and Williamson 2008).

Table 4 Policies required to rebalance global demand

Country	Internal demand	Exchange rate
Argentina	IB	Nil
Australia	IB	–
Brazil	IB	–
Canada	ES	Nil
Chile	IB	–
China	IB	+
Colombia	IB	–
Czech Republic	ES	–
Euro area	ES	–
Hong Kong	IB	+
Hungary	ES	–
India	IB	–
Indonesia	IB	Nil
Israel	IB	Nil
Japan	ES	–
Korea	IB	Nil
Malaysia	IB	+
Mexico	ES	Nil
New Zealand	ES	–
Philippines	IB	Nil
Poland	IB	–
Singapore	IB	+
South Africa	IB	–
Sweden	ES	Nil
Switzerland	ES	+
Taiwan	IB	+
Thailand	IB	–
Turkey	IB	–
United Kingdom	ES	Nil
United States	ES	Nil

IB = internal balance.
ES = excess supply.

Note: Countries with overvalued currencies are marked – in the final column; those with undervalued currencies are marked +; and those within 2.5 percent of estimated equilibrium are marked Nil.

Sources: Table 1; OECD (2010); IMF (2010); and authors' calculations.

A third group of countries is those emerging-market economies and developing countries (of which the most conspicuous is China) which have heavily managed exchange rates. For reasons explained previously, these tend to have highly undervalued exchange rates. These countries also have healthy levels of demand, and they therefore lie on the IB curve, on the border between zones II and III. In some cases demand might even be considered excessive, putting them to the right of IB.

Finally there is the United States. Clearly it lies to the left of IB. The Cline-Williamson index places it as slightly overvalued, and identifies the source of the overvaluation as exclusively against the third group of countries. Indeed, the dollar is undervalued relative to the majority of other currencies, as shown in the final column of table 3.

DERIVING POLICY IMPLICATIONS LINKING EXTERNAL AND INTERNAL BALANCE

The policy implications for each of our 30 countries are shown in table 4. A conspicuous feature is that almost all the industrial countries (except Australia) are shown as short of aggregate demand. In contrast, most of the emerging-market economies and developing countries have adequate demand and high rates of growth (the exceptions being Czech Republic, Hungary, and Mexico).

A major reason for this contrast is to be found in the exchange rate policy of Group III. (It is not the whole explanation, because a number of emerging-market economies like Brazil have overvalued exchange rates and still enjoy robust growth.) The competitive exchange rates of Group III serve to divert demand away from the industrial countries and toward Group III.

As discussed above, our analysis points clearly to the desirability of revaluation by China and a number of other East Asian currencies. Since China lies on the IB curve, however, it needs to accompany revaluation by actions to stimulate domestic demand. In other words, a vertical move upward for China in figure 1, toward currency appreciation alone, would initially leave the economy to the left of its IB line, moving it into excess domestic supply. What effect would a corrective combination of revaluation with domestic stimulus policies have on Chinese welfare?

First, note that China has the potential to expand demand domestically. There are myriad unmet needs in China, in particular involving improved social security and public pensions (see Bergsten, Freeman, Lardy and Mitchell 2009, chapter 6). Increasing these might reduce private as well as public saving, insofar as private saving is motivated by precautionary considerations. And there is no political or bond market constraint on increased public expenditure, of the sort that rules out further fiscal expansion in so many industrial countries. Second, note that a replacement of foreign demand by domestic demand could be expected to *increase* rather than reduce domestic employment. The effect on the growth of GDP is perhaps ambiguous, since it is widely believed that the growth of

manufacturing has beneficent externalities. But the effect of redirecting demand from the capital-intensive manufacturing sector to the relatively labor-intensive services sector would increase the demand for labor per unit of capital investment. So it is not true that defense of employment provides a valid reason for China to resist an appreciation. That argument is based on the fallacy of assuming that revaluation would occur in isolation, rather than being undertaken in conjunction with an expenditure-increasing policy. Third, note the presumption that welfare would increase, as current expenditure for the benefit of Chinese consumers would rise and replace the low-return accumulation of US securities. Fourth, note that this is exactly what is meant by "rebalancing" world demand.

The other part of what is required to rebalance world demand is a decline in US consumption (and that of other deficit countries) relative to what was experienced in the precrisis years. This does not require a depression of consumption at the present time, since output is depressed below its full-potential level. But as and when US output recovers, it will have to undertake a similar contractionary fiscal policy to that already launched in many countries of Europe. This would seem a sensible quid pro quo for emerging-market economies to seek in Seoul.

CONCLUDING REMARKS

Two important policy conclusions emerge from this analysis:

1. It would be very wrong for the G-20 to condemn all countries that are trying to prevent their exchange rates from appreciating. One needs to ask which currencies are undervalued and concentrate on preventing their intervening and tightening capital controls.
2. It is a fallacy to regard exchange rate correction and actions to change the level of demand as alternatives and to welcome the latter as more profound than "mere" exchange rate changes. The two are complementary. The G-20 should recognize that the world needs an appropriate combination of both if it is to succeed in rebalancing world demand while restoring worldwide prosperity.

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Appendix A: Supplementary tables

Table A.1 IMF estimates of current account balance in 2015 (percent of GDP)

Country	April WEO	October WEO
Argentina	1.41	1.06
Australia	–5.76	–6.02
Brazil	–3.19	–3.30
Canada	–1.86	–1.80
Chile	–2.84	–2.32
China	8.05	7.80
Colombia	–1.11	–1.47
Czech Republic	–2.50	–0.27
Euro area	–0.05	0.17
Hong Kong	7.56	9.01
Hungary	–3.50	–1.75
India	–1.96	–2.22
Indonesia	–1.13	–0.99
Israel	3.16	4.49
Japan	1.84	1.87
Korea	1.92	2.05
Malaysia	12.17	10.16
Mexico	–1.53	–1.31
New Zealand	–8.19	–6.62
Philippines	0.40	2.11
Poland	–2.93	–2.45
Singapore	21.32	14.14
South Africa	–7.36	–6.47
Sweden	5.72	6.19
Switzerland	11.88	11.35
Taiwan	7.99	8.63
Thailand	0.17	0.01
Turkey	–4.68	–6.16
United Kingdom	–1.42	–1.09
United States	–3.50	–3.34

WEO = International Monetary Fund, *World Economic Outlook*.

Source: Authors' calculations.

Table A.2 FEER-consistent and actual exchange rates against the dollar

				May 2010		October 2010	
Country	FEER-consistent rate, May	Inflation (percent)	Inflation-adjusted FEER-consistent rate	Actual	Percent change needed	Actual	Percent change needed
Argentina	3.83	11.0	4.00	3.90	1.8	3.96	–1.1
Australia*	0.82	3.1	0.81	0.87	–5.5	0.98	–17.5
Brazil	1.81	5.2	1.85	1.81	0	1.68	–9.0
Canada	1.03	2.1	1.03	1.04	1.6	1.02	–1.2
Chile	518	3.7	525	535	3.3	485	–7.7
China	5.50	3.5	5.57	6.83	24.2	6.67	19.7
Colombia	1,956	3.2	1,978	1,985	1.5	1,810	–8.5
Czech Republic	19.6	2.3	19.8	20.5	4.3	17.7	–10.8
Euro area*	1.31	1.6	1.31	1.25	4.6	1.39	–5.7
Hong Kong	6.30	2.7	6.36	7.79	23.5	7.76	22.0
Hungary	211	3.5	214	221	4.7	197	–7.8
India	42.6	8.6	44.1	45.9	7.7	44.4	0.7
Indonesia	7,997	5.9	8,178	9,167	14.6	8,928	9.2
Israel	3.65	1.1	3.66	3.80	3.9	3.61	–1.4
Japan	84.0	–1.1	84.0	92.0	8.8	81.7	–2.7
Korea	1,066	3.0	1,077	1,167	9.5	1,122	4.2
Malaysia	2.52	2.2	2.54	3.25	29	3.10	22.1
Mexico	12.6	4.5	12.8	12.8	1.3	12.4	–2.8
New Zealand*	0.57	4.1	0.56	0.70	–18.3	0.75	–25.5
Philippines	40.8	4.5	41.5	45.6	11.8	43.4	4.5
Poland	3.11	2.4	3.14	3.24	4.2	2.84	–9.5
Singapore	0.96	4.1	0.98	1.39	44.9	1.30	32.9
South Africa	8.37	5.8	8.55	7.66	–8.5	6.91	–19.2
Sweden	6.80	1.6	6.83	7.72	13.5	6.68	–2.2
Switzerland	0.97	0.7	0.97	1.13	16.6	0.97	–0.1
Taiwan	26.2	2.3	26.4	31.8	21.4	30.8	16.7
Thailand	29.2	1.5	29.4	32.4	10.8	30.0	1.9
Turkey	1.65	7.6	1.70	1.55	–5.8	1.42	–16.2
United Kingdom*	1.53	2.6	1.52	1.46	4.5	1.60	–4.2
United States	1	0.5	1	1	0	1	0

* Dollars per currency unit. All others: currency unit per dollar.

FEER = fundamental equilibrium exchange rate

Note: Inflation = annual rate, December to December. Adjustment is for five months.

Source: Authors' calculations.

Table A.3 OECD and IMF estimates of the output gap in 2011 (percent of GDP)

Country	OECD	IMF
Australia	–1.7	0.1
Canada	–2.0	–1.5
Czech Republic	–3.7	n.a.
Euro Area	–3.9	–2.5
Hungary	–4.0	n.a.
Japan	–2.1	–4.1
Mexico	–1.9	n.a.
New Zealand	–1.8	–1.8
Poland	0.8	n.a.
Sweden	–6.0	–1.5
Switzerland	–2.0	n.a.
United Kingdom	–5.1	–2.3
United States	–1.7	–4.3

OECD = Organization for Economic Cooperation and Development

IMF = International Monetary Fund

n.a. = not available.

Sources: OECD (2010); IMF (2010).

Appendix B: Sources for information on currency intervention

Economy	Source
Various[a]	Beattie, Cadman, and Bernard (2010)
Canada	McCrank (2010)
Czech Republic	Winfrey and Tong (2010)
Eurozone	Bremer, Vinocur, and Adler (2010)
Hungary	Winfrey and Tong (2010)
India	Krishnan and Antony (2010); Telegraph India
Korea	Frangos (2010)
Malaysia	Kinetz 2010
Mexico	Gould and Barden (2010)
New Zealand	Fallow (2010)
Philippines	Kinetz (2010)
Poland	Blackstone (2010)
Singapore	Adam (2010)
South Africa	Stewart (2010); Mundy (2010)
Sweden	Alder and Dobson (2010)
Switzerland	Wille (2010)

a. Argentina, Australia, Brazil, Chile, China, Colombia, Indonesia, Israel, Japan, Korea, Singapore, Taiwan, Thailand, Turkey.

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