How much real dollar depreciation is needed to correct global imbalances?

1. Introduction

In the mainstream view, a weak dollar is the natural consequence of the long string of large and increasing current account deficits run by the US in the past decade. In ten years, from 1997 to 2007, the current account deficit of the US increased from 1.7 percent of US GDP to 1.7 percent of world output.

Already in 2000, leading economists such as Maurice Obstfeld and Kenneth Rogoff warned that adjustment would require substantial depreciation of the dollar in real terms and on a multilateral basis. Specifically, based on a stylised model, Obstfeld and Rogoff (2005) showed that eliminating a current account deficit of 5 percent of GDP in an economy like the US would require that economy's real exchange rate to depreciate between 35 and 50 percent.[1] Meanwhile, from its peak in 2002 to the beginning of 2008, the dollar lost almost one third of its value in real terms (CPI based). Against the major currencies the fall was much more pronounced: about 40 percent in real terms – mirroring the strong appreciation of the euro (up to 50 percent!).

Questions such as "How much dollar depreciation should Europe and the world expect in the future as a consequence of the US imbalance?" or "To what extent will the dollar fall be accompanied by a global realignment of Asian currencies, supposedly reducing the pressure on the euro?" are in everybody's mind, and rightly so. Yet, to a large extent the answer to these questions builds on some understanding of the specific mechanisms by which real dollar depreciation is an essential step towards global adjustment. After all, it is these mechanisms that will shape the macroeconomic outlook in the next few years.

In what follows, we reconsider the argument that the US currency must weaken substantially in real terms to correct the US current external imbalance. The emphasis here is on "real terms", because what counts in the adjustment process is the movement of the price of US goods relative to goods produced in the rest of the world.

Addressing this issue is important because estimates of the real dollar depreciation required for a correction of global imbalances provide a natural anchor for trends in the currency market. The world has already experienced ample swings in the dollar-euro exchange rate. Early on in the decade this rate almost reached 80 dollar cents per euro; it may well be possible that the parity will fall as low as 1.60 dollars per euro. But would the exchange rate then remain persistently at these extreme levels?

The text below will emphasise that the largest estimates of real dollar depreciation (such as the ones by Obstfeld and Rogoff 2005 mentioned above) are based on models which typically assume a strong adjustment in the *domestic* relative prices of non-tradable goods (say, services) within the US and abroad. Strong movements in these prices relative to international prices are clearly possible, but they would be unprecedented by historical standards, and are not supported by econometric evidence. In addition, it is hard to think that large movements in domestic prices would fail to create strong incentives to reallocate production across sectors (away from the non-tradables sector), which would in turn reduce the need for price movements.

The chapter concludes by discussing two recent contributions that reconsider the mechanisms underlying current account adjustment, pointing to much milder scenarios of real dollar depreciation (Dekle et al. 2007 and Corsetti et al. 2008). Carrying out exercises similar in spirit to those of Obstfeld and Rogoff (2005 and 2007), these new contributions confirm the presumption that closing the US current account imbal-

[1] The assessment of the real dollar depreciation required to correct global imbalances carried out by international organisations was often less extreme. As of 2006, the IMF had constructed scenarios with real effective dollar depreciation in the range of 15 percent, under the so-called soft-landing scenario. See, for example, IMF (2006), Box 1.3. Similar estimates are discussed in Faruqee et al. (2007)

ance will require the dollar to weaken persistently in real terms. But the depreciation required for a sustainable current account adjustment would be much lower. The results suggest that a real dollar depreciation of between 10 and 20 percent may well be enough (see also Corsetti 2007).

What does this mean for Europe? Early assessments of the equilibrium exchange rate between the euro and the dollar, especially the ones based on purchasing power parity, by and large pointed to values between 0.90 and 1.30 dollars per euro,[2] an interval also suggested by Figure 1.5 in Chapter 1. Our conclusion is that at the beginning of 2008 the real exchange rate between the euro and the dollar has already reached, and probably overshot, the value needed for global rebalancing – especially if Asian countries end their (explicit or implicit) peg to the dollar.

2. The ABC of dollar depreciation: terms of trade versus internal price adjustment

The 2005 EEAG Report already discussed in great detail different views on what lies at the heart of the emergence of global imbalances in the 1990s, and the implications of such imbalances for Europe. That report also included a synthetic introduction to the ABC of dollar depreciation and external adjustment according to leading models. To introduce our new argument, it is worth reconsidering once again the role of relative price movements in rebalancing the external account. The starting point consists of a definition and simple national accounting.[3]

To begin with, recall that the real exchange rate is the price of US consumption relative to consumption abroad. It is customarily measured by multiplying the nominal exchange rate by the ratio of domestic to foreign CPI. The CPI, of course, includes both goods that are traded across the border and goods that are not traded because their value is too small relative to (international) trade costs. Hence, real exchange rate movements can be roughly decomposed into changes in the relative price of traded goods produced at home and abroad, that is, the *terms of trade,* and changes in the price of non-traded goods in terms of traded goods.

As regards national accounting, the simplest identity states that the value of a country's total domestic demand plus net exports must be equal to the value of its output:

Value of Domestic Demand + Value of Net Exports = Value of GDP

For our purposes, it is useful to rewrite this identity as follows. First, net exports are replaced with some *target* level of current account adjustment, that is, of an assessment by how much adjustment would be required to correct the external imbalances. As a reference estimate, consider an adjustment up to 5 percentage points of GDP, which would correspond to a de facto elimination of the US external imbalance. Second, in order to highlight the role of relative price adjustment, demand and GDP are broken down into two components, distinguishing between traded and non-traded goods. We obtain:

$P_N D_N + P_T D_T + D_F$ + Current Account Adjustment = $P_T Y_T + P_N Y_N$

In this identity, P_N and P_T denote the prices of US non-tradables and US tradables, respectively, both expressed in terms of US imports (which consist of foreign tradables); D_N, D_T and D_F denote the US demand for domestic non-tradables, domestic tradables and foreign tradables (imports); Y_N and Y_T denote US output of non-tradables and tradables.

With the different components of output and demand spelled out explicitly, the above identity is useful to capture the essence of the adjustment mechanism. The logic of this mechanism is straightforward. Reducing the US deficit is equivalent to a transfer of resources from the US to the rest of the world. Adjustment thus requires a decrease in US demand relative to production, matched by an increase in demand relative to output in the rest of the world. Such global reallocation of demand in turn requires a change in relative prices as well as a change in relative income and wealth.

To see the role of relative price adjustment most clearly, assume that all quantities produced in the world (the *Y*'s in the above identity) remain constant before and after the adjustment. This means that the whole adjustment mechanism works through prices and

[2] See Chinn and Alquist (2000), Alberola et al. (2002), Maeso-Fernandez et. al (2002), and Rosenberg (2003) among others.
[3] The model below draws on the economics of "transfer", referring to the classic controversy between Keynes (1919, 1929a,b,c) and Ohlin (1929a,b).

demand movements (the *P*'s and the *D*'s in the identity). This is essentially the exercise proposed by Obstfeld and Rogoff (2005).

For a given output, current account adjustment requires all prices to move in equilibrium. The relative price of US tradable goods *(P_T)* must fall to raise foreign demand for US exports, and discourage US demand for imports (causing a fall in D_F). But, other things equal, cheaper US tradables would mean that US households and firms will demand more of them, at the expense of their demand for US non-tradables. As the supply of these goods is given by assumption, the relative price of US non-tradables *(P_N)* must also fall, to ensure that domestic demand for US non-tradables will be high enough to meet their supply.

A striking result in the Obstfeld and Rogoff (2005) calculations concerns the relative magnitude of the price changes for tradables and non-tradables, once reasonable demand elasticities for different types of goods are used to calibrate the model. These authors propose the following scenario. Holding output quantities fixed, the fall in the international price of US tradables (that is the adjustment in the terms of trade) accounts for a real dollar depreciation of between 5 and 15 percent; the change in the relative price of non-tradables accounts for a real dollar depreciation of between *20 and 30 percent.* In this scenario, it is the change in the latter relative price which clearly makes up the lion's share. The movement in non-tradables prices could be several times larger than changes in the terms of trade.

To understand the concrete meaning of these estimates, it is important to keep in mind that services are mostly non-tradables, while manufactured goods are mostly tradables; over time, productivity differentials across sectors cause the price of services to fall steadily in terms of the price of manufactured goods, as predicted by the Harrod-Balassa-Samuelson hypothesis, amply discussed in the 2002 EEAG Report. The reasoning above suggests that for the US to eliminate its current account deficit, the price of US services should fall by up to one third *relative to trend,* in terms of the (mostly traded) US manufacturing goods.

To be accurate, it should also be stressed that the above scenario is not the only possible outcome of adjustment. According to the model used in the above calculation, there are different ways in which a given real dollar depreciation can occur: real depreciation can result from, say, a sharp increase in the price of non-tradables in the rest of the world, as opposed to a fall in the US. The calculations in the example by Obstfeld and Rogoff nonetheless raise an important issue: how much *internal* relative price adjustment in the US can be anticipated in a process of external adjustment?

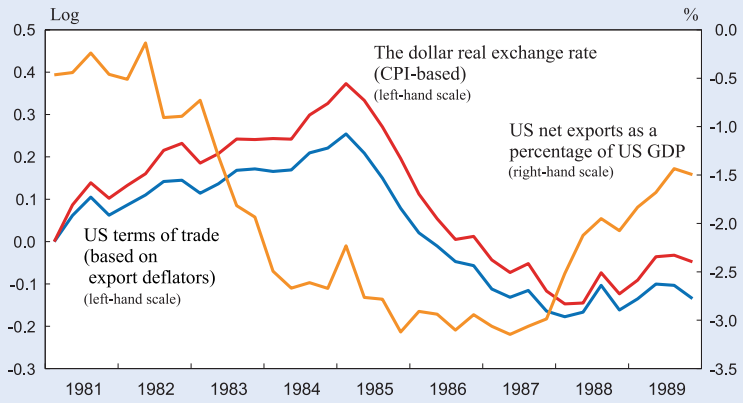
3. Is a sizeable change in internal prices likely to happen in the US?

Some insight on the different dynamics of relative price movements at the domestic and international level can be gained by reconsidering previous episodes of real depreciation and current account adjustment. We first review a case study, then some econometric evidence.

The most relevant episode for our purpose is clearly the one experienced by the US in the mid-1980s. After a period of substantial appreciation associated with current account imbalances, the dollar started to depreciate in 1985, and fell throughout 1989, after which it roughly stabilised. The current account initially deteriorated somewhat, then stabilised in 1986–87, and

Figure 2.1

The US external adjustment in the 1980s



Note: The graph plots the logs of the terms of trade and the real exchange rate. The difference between two points of a series is a percentage change. All series are calculated vis-à-vis a GDP-weighted aggregate of OECD countries (excluding the US).

Sources: OECD Economic Outlook Database; Corsetti et. al (2006); calculations by the EEAG.

eventually started to improve from 1988, with a three-year delay from the beginning of the dollar depreciation phase. These patterns are illustrated by Figure 2.1, which plots US net exports (whose behaviour are very similar to the current account) together with the US terms of trade and the real exchange rate of the dollar (both CPI and PPI-based), measured against an aggregate of other OECD countries. The episode of the US current account adjustment in the 1980s, and the debate around it, is discussed in great detail by Krugman (1991) among others.

In the three-year period going from the beginning of 1985 to the beginning of 1988, the dollar depreciated in real terms by about 50 percent against the rest of the OECD countries, as opposed to a cumulative appreciation as high as 15 percent in the preceding three years. On a multilateral basis (considering all trade partners of the US), the corresponding figures are 35 percent and 20 percent, respectively. From 1988 on, in real terms the dollar fluctuated around the new, weaker level for a long time, well into the 1990s.

Further insight into the role of prices can be gained by looking at Figure 2.2, which plots the US terms of trade together with the relative price of non-tradables. The latter is proxied by the ratio of the US Consumer Price Index for Services and the US Producer Price Index (PPI). The figure also includes a linear trend through (our proxy for) the relative price of non-tradables.

Over the whole period displayed in Figure 2.2, the CPI for services kept increasing steadily in terms of the PPI. The trend line captures the secular relative price increase of non-tradables. Compared to this trend, however, the figure unveils interesting patterns.

First, remarkably, the rate of increase in the relative price of non-tradables actually became faster in a two-year window after 1985, when the dollar was depreciating sharply, relative to the period before 1985, when the dollar was still appreciating.[4] This (admittedly temporary) acceleration seems at odds with the model discussed above, as this predicts that the price of non-tradables would actually weaken together with the real exchange rate during phases of external adjustment.

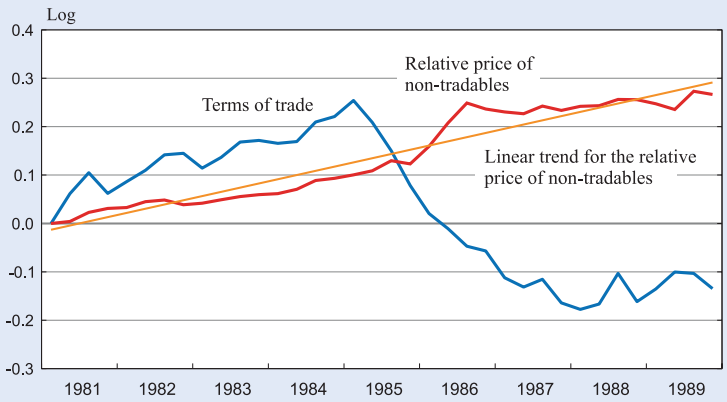
Nonetheless, one should observe that in the three-year period after 1985, the US external deficit did stabilise but did not narrow. A significant change in both internal prices and external deficit, consistent with the argument illustrated by Obstfeld and Rogoff, eventually occurred, but only over the last two years of the decade. It was only then that the price of non-tradables rose at a much lower rate relative to trend, and the current account started to show significant improvement.

The lesson to draw from these considerations is not straightforward. On the one hand, consistent with the leading model of current account adjustment, there was a notable correction of the non-tradables prices around the time when the current account stabilised and started to improve, that is, between 1987 and 2000.

One the other hand, Figure 2.2 also highlights a marked movement of the price of non-tradables in the opposite direction immediately after the beginning of dollar depreciation, especially between 1986 and 1987. In light of the strong relative-price increase for non-tradables in those two years, the reversal in the following years appears less striking, as it may correspond, at least in part, to an offsetting movement. Obviously, cyclical considerations heavily influence these numbers.

Figure 2.2

US relative price of non-tradables and terms of trade in the 1980s



Note: The graph plots the logs of the terms of trade and the relative price of non-tradable goods. See also Figure 2.1.

Sources: OECD Economic Outlook Database; Corsetti et. al (2006); calculations by the EEAG.

[4] A similar picture emerges if one looks at different proxies for non-tradable prices, such as the ratio of the CPI to the price of capital equipment. For this indicator, there is no change in dynamics in the three-year window before and after 1985.

Most strikingly, Figure 2.1 shows that the real exchange rate remained strongly correlated with the US terms of trade before and over the entire adjustment period. In Figure 2.1, the two international prices closely track each other. In the period 1985–1987, for instance, the US terms of trade (based on export deflators) deteriorated by about 40 percent against OECD trade partners, against a 50 percent decline in the real exchange rate. As shown by Figure 2.2, over this period of dollar and US current account adjustment in the 1980s, the terms of trade varied substantially more than internal relative prices.

So, while the experiences from the 1980s suggest that movements in domestic relative prices of non-tradable in the US were eventually consistent with the model, the size of these movements were quite contained, and in any case significantly smaller than the corresponding movements in the terms of trade.

These conclusions are backed by empirical estimates of the effects of deficits on the terms of trade and the relative price of non-tradables. According to the baseline econometric results for the G3 countries by Galstyan (2007), for instance, the percentage deterioration in the terms of trade in response to a reduction in the external deficit is three times larger than the percentage fall in the price of non-tradables (4.7 versus 1.6). Remarkably, this ratio is similar for other countries.

In light of this evidence, it is not surprising to find that also now there is little or no evidence of strong internal relative price adjustment in the US, despite the large slide in the external value of the dollar since 2002. The rate of price increase for services has constantly outpaced the rates of price increase for other broad categories of goods in the US: between the end of 2002 and the end of 2006, the CPI for services has increased by 12.8 percent, more than 2 percentage points faster than the overall CPI (10.6 percent), and twice as fast as the CPI excluding food and energy (6.3 percent). The PPI (excluding food and energy) rose by even less, by about 5.6 percent. Over the same period, the dollar depreciated by about 15 percent in real effective terms, although (admittedly) there was hardly any sign of current account adjustment.

In the next few years, it is plausible to expect some effects of dollar depreciation on the relative rate of price increase by sectors in the US, with the rates of price increase for non-tradables falling somewhat relative to the rates of price increase for tradables (always relative to trends). According to the model, this should be required for the US external position to improve in a substantial and sustainable way. Correspondingly, Europe should expect internal relative price movements in the opposite direction. It would be highly unlikely, however, that these differentials in the rates of price increase lead to internal realignments of dramatic magnitudes.

4. Prices and valuation effects in the global rebalancing

Real dollar depreciation also causes "valuation effects", that is movements in the value of US incomes relative to the rest of the world. To see the "income side" of the adjustment mechanism discussed so far, focus on the right-hand side of the national accounting identity in Section 2 above. For given output quantities, the fall in the price of both the US traded *and* the US non-traded goods relative to foreign tradable prices lowers the value of US GDP relative to the value of foreign GDP. Inherent in the logic of the exercise proposed in the first part of this text, US residents are relatively poorer because of price adjustment, even if they produce exactly the same amount of goods.

In this respect, real dollar depreciation is akin to a persistent slowdown of US output growth relative to the rest of the world: in either case the relative *value* of US output would fall, reducing US domestic demand relative to foreign demand, hence making room for current account adjustment. Those who believe that the only way to reduce the US external deficit is a pronounced and persistent US recession essentially emphasise the role of quantities over prices in driving down US relative income.

Now, we have argued above that while the leading model of current account adjustment attributes relative wealth and demand effects to strong movements in the average price of non-tradable goods, a large correction in this relative price is not very likely in practice. Yet, one could argue that the leading model is actually right on target, once the emphasis is placed on the price of housing (after all houses are non-tradables) rather than on the price of non-tradable goods and services entering the Consumer Price Index.

Indeed, a large correction in the housing prices in the US per se can generate substantial wealth and demand

effects consistent with external rebalancing – as long as the fall in these prices hits this country more than the rest of the world. Not only housing has a large weight in national wealth. Most importantly, housing wealth accounts for a very large share of the portfolio owned by low- and middle-income households, who arguably have a relatively higher propensity to spend than richer households. Hence, a fall in housing wealth can be expected to have a comparatively stronger impact on final demand than other components of national wealth.

One may observe that, starting in 2006, the fall in the price of housing indeed coincided with an acceleration in the rate of dollar depreciation and a pick-up in the pace of US net export growth. Assessing the specific role of housing in the global rebalancing is, however, quite complex. First, global portfolio diversification implies that the losses from a fall in asset prices in one country are partly borne abroad. At the time of writing, the amount and distribution across countries of the direct and indirect losses from the subprime mortgage crisis in the US is still unclear. Moreover, the financial turmoil created by this crisis may have global wealth and output implications well beyond the direct losses in the mortgage markets. Second, developments in the housing sector obviously have important cyclical consequences for the country as a whole, driving the current account.

Some of the external effects of a substantial contraction in real estate markets are direct, via import demand from the sector. Evidence on this transmission channel is provided by researchers at the New York Fed, who examined the year-to-year growth rate of all non-petroleum imports by the US, and compared this to the growth rate of imports commonly used as inputs by the residential construction sector (see Hellerstein 2008). The main findings are summed up in Figure 2.3 below. The graph shows that the year-to-year growth rate of housing-related imports was very dynamic during the years of the housing "bubble": it is at least as high, often higher, than total imports (excluding oil) through late 2006. From the end of 2006 on, the growth of housing-related imports slowed down considerably, once again moving closely together with total imports.

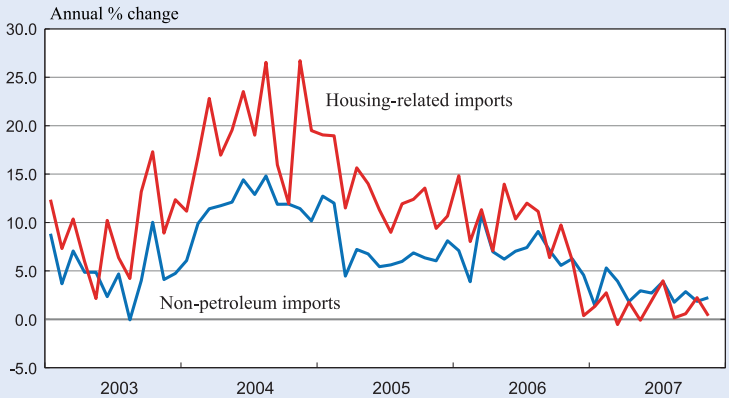
In addition to the direct implications for import demand, a real estate crisis drives the external account to the extent that it creates a recessionary impulse (which per se reduces US import demand), and motivates a reaction by the Federal Reserve, in the form of interest rate cuts (which creates external demand via dollar depreciation). An analysis of this scenario is proposed by Krugman (2007).

These cyclical considerations, including the possibility of a severe global slowdown induced by a credit crunch, obviously weigh on the currency market. Arguably, already in 2007 investors took into account possible differences in the response of the European Central Banks relative to the Federal Reserve Bank. A US slowdown and a large fall in the dollar would clearly contribute to accelerating the correction of the US external imbalance.

Yet it is important to stress that sustained adjustment of the external imbalance can only occur through a shift in relative wealth and demand over the medium and long run, that is well beyond the time frame of a business cycle downturn.

Figure 2.3

Housing-related and non-petroleum US imports



Note: Housing-related imports are calculated using input-output tables from the Bureau of Economic Analysis, reporting the average value of other industries' output used by the residential construction industry each year.

Source: Hellerstein (2008).

5. Scenarios for the medium run

If the internal relative prices of goods and services in the US and abroad cannot be expected to move substantially during the process of external adjustment, how far can the dollar be expected to fall in real terms? Once again, the focus here is not on short-run developments but over a longer horizon.

There are reasons to expect a long period of dollar weakness, but the fall in the US currency required to foster current account adjustment is likely to be smaller than suggested by estimates that place a large weight on the adjustment in non-tradable prices.

First, changes in wealth and international prices are bound to have an impact on the level and composition of output in the US and abroad. Indeed, it is hard to believe that internal relative price can move by almost 1/3 without causing significant sectoral shifts in production, a possibility ruled out by construction in the example proposed by Obstfeld and Rogoff that we discussed in Section 2 above. In some other examples by the same authors, it is indeed shown that, for given demand elasticities, the need for internal price adjustment and therefore real dollar depreciation can decrease considerably if the composition of US output by sector changes in favour of tradables as a response to relative-price movements (see Obstfeld and Rogoff 2007).

5.1 Rebalancing and market dynamics

A relatively small dollar depreciation is predicted in several recent contributions that develop a variety of models, allowing for some adjustment in the level and composition of output. The numerical exercises proposed by Corsetti, Martin and Pesenti (2008), for instance, suggest that closing the US current account deficit (from 5 percent of GDP to zero) could lead to a combination of lower US consumption (– 6 percent), and higher US employment (+ 3 percent), relative to trend. This would then correspond to a rate of real dollar depreciation of the order of 20 percent.

Because of entry and exit of new firms and product varieties in the export market over time, the "required" dollar depreciation could actually become smaller than 20 percent (even substantially smaller; see Corsetti Martin and Pesenti 2007), without necessarily changing the adjustment in consumption and employment (which could still be – 6 percent and + 3 percent, respectively). These results are particularly noteworthy, because they suggest that the macroeconomic costs of current account adjustment (in terms of consumption and employment) are not necessarily increasing in the extent of real dollar depreciation.

Key to these scenarios is the degree of economic flexibility and adaptability of both the US economy and the economies in the rest of the world. In the baseline exercise, adjustment would coincide with some contraction in the US non-tradables good sector (– 2 percent), coupled by a substantial expansion in tradables, both for the domestic market (+ 11 percent) and for the foreign markets (+ 24 percent). The idea is that product innovation and differentiation could reduce the need for a large weakening of the international prices of US products. Observe that in light of this consideration, in the next few years European firms can be expected to face much stronger competition by firms overseas, even if the adjustment in the exchange rate turns out to be modest.

5.2 A multi-country model

A similar assessment is presented by Dekle, Eaton and Kortum (2007), based on a quite different model. These authors build a multilateral model calibrated to 40 countries using 2004 data on GDP and bilateral trade flows in manufacturing goods.

Table 2.1 reports gross and net trade in manufactures for a subset of countries considered in this study. The table includes 14 European countries, Japan, China, India, and the US. Observe that ten of the 14 European countries included in the table run a deficit, the other four a surplus. The largest deficits are run by the UK, Spain and the area comprising Belgium, the Netherlands and Luxemburg, i.e. the Benelux countries. The largest surpluses are run by Germany, Ireland, Sweden and Finland.

These authors ask what would happen, in general equilibrium, if manufacturing trade deficits around the world had to be adjusted to set *all* current account balances equal to zero. The target adjustment is reported in the fourth column in the table, under the heading "Counterfactual balance". For the US, the counterfactual balance is of course staggering: it requires a shift from a deficit of almost 500 billion US dollars to a surplus of 180 billion US dollars. Similarly large is the required adjustments with the opposite sign, for China and Japan.

Observe that depending on the overall current account in 2004, the "Counterfactual balance" requires significant adjustment also in Europe. Notably, the surplus in Germany is cut by one half; the surplus should turn into a deficit in Sweden; the external deficit run by Benelux countries substantially widens. On the other hand, Italy is required to increase its manufacturing surplus. Ireland's external position is unaffected.

Table 2.1

Trade in manufactured goods: values in 2004 and counterfactual adjustment.

	Gross trade (a)		Trade balance (a)	Counterfactual balance (a)	Relative wage adjustment (b)
	Exports	Imports			
Austria	82.4	83.5	– 1.1	– 3.1	1.2
Belgium, the Netherlands and Luxemburg	307.8	371.6	– 63.7	– 136.8	1.5
Denmark	42.6	52.2	– 9.5	– 16.7	4.6
Finland	50.5	36.2	14.4	3.4	5.2
France	333.0	338.2	– 5.3	– 0.3	0.4
Germany	750.9	541.4	209.5	106.5	3.1
Greece	9.3	38.9	– 29.5	– 17.3	– 11.2
Ireland	115.2	49.1	66.2	66.0	0
Italy	278.3	257.1	21.2	35.6	0
Norway	22.8	39.2	– 16.4	– 52.4	34.5
Portugal	29.9	40.6	– 10.7	– 1.0	– 6.1
Spain	132.0	194.7	– 62.8	– 9.1	– 4.8
Sweden	100.3	77.1	23.2	– 5.5	7.3
United Kingdom	254.5	363.7	– 109.2	– 75.3	– 1.4
China and Hong Kong	816.8	695.0	121.8	36.2	2.5
India	58.5	53.1	5.4	– 2.7	1.7
Japan	545.2	268.2	277.0	103.7	3.7
United States	673.7	1159.3	– 484.6	179.4	– 6.8

(a) Data are for 2004 in billions of US$. – (b) Percentage change.

Source: Deckle et al., (2007), Table 2.

What is the magnitude of the macroeconomic adjustment required to engineer such a fix of external imbalances? The surprising answer is that according to the trade model adopted in the exercise, the magnitude of adjustment is, on average, small.

Strikingly limited is the implied adjustment of relative wages (labour costs). For example, wages in the country with the largest deficit (US) fall only by 10 percent relative to wages in the country with the largest surplus, which is Japan. Overall, the relative wage of the US must adjust by about 7 percent. Among the European countries in the table, relative wage appreciation is quite contained everywhere except for Norway. Relative wage depreciation is expected for Greece, Portugal, Spain and the UK.

In all these countries, however, wages hardly change in real terms, mostly because of the large component of non-tradables in total consumption but also because of a home bias in domestic spending on manufacturing goods. Overall, wages move by approximately 1 percent in real terms, with the exception of Norway where they increase by 4.2 percent (see Deckle et al. 2007 for details).

Changing trade elasticities clearly affects the numerical estimates from the exercise. In some robustness checks using a lower elasticity, the size of relative wage adjustment in the US rises but only up to 18 percent relative to China and 20 percent relative to Japan. The adjustment in US real wages is barely affected.

5.3 Beyond trade-related considerations

The two exercises reviewed above are similar in spirit to the ones proposed by Obstfeld and Rogoff (2005 and 2007): they are static in nature and largely focus on the equilibrium relative price adjustment required to correct "global imbalances". For this very reason, however, they prove that general-equilibrium trade models do not necessarily support the view that substantial correction is possible only with a very large real dollar adjustment.

It should be stressed that these calculations are not forecasts. They point to plausible outcomes in a world where a large debtor (the US) starts to service its debt, therefore compressing domestic demand relative to foreign demand. But the exchange rate is driven by many different factors. For instance, an especially important one, which we have not treated explicitly, is relative productivity growth (and market expectations about it). Many observers believe that the differential

in favour of the US, which seems to have driven much of the current account deficits from the mid-1990s on, has now substantially fallen.

Nonetheless, an additional reason why the dollar fall need not be dramatic has to do with the currency and asset class composition of the US external portfolio (including both gross assets and gross liabilities). As is well known, most of the US debt is denominated in dollars, whereas a large fraction of this country's external assets are denominated in foreign currency. In the short run, these differences may provide opportunities for the US to alleviate the burden of its foreign debt through exchange rate depreciation: other things equal, dollar depreciation raises the value in dollars of foreign-currency denominated assets owned by the US, without affecting the value of the dollar-denominated liabilities of this country. As the current account is the difference in the value of net foreign assets between the beginning and the end of a year:

Current Account = Change in Net Financial Assets,

any revaluation of foreign assets held by US residents would clearly reduce the external deficit for a given value of net exports. This mechanism creates a potentially important channel through which international price movements cause valuation effects which feed back into the overall external position of a country, much discussed in recent research work (see Chapter 2 of EEAG 2005 for a discussion).

While dollar depreciation can generate short-run gains, the abuse of the opportunity to manipulate values through the exchange rate would create dynamic risks. The main risk is that excessive and/or systematic recourse to depreciation would convince international investors to redirect their portfolios away from dollar-denominated assets, ultimately raising issues about how to finance the US external deficit. But the US monetary authorities are well aware of the need to maintain confidence in the dollar.

6. Conclusions

Closing the US current account deficit does require a weak dollar, but current assessments of global rebalancing differ regarding the required real dollar depreciation. In this chapter we have argued that, in the leading model of current account adjustment, estimates of large real depreciation presuppose a strong fall in the relative price of domestic non-tradables within the US economy. In light of the evidence from the 1980s as well as of the results from econometric studies, such sizeable corrections in internal relative prices, larger than changes in the US terms of trade, are quite unlikely.

According to recent studies, the magnitude of a real depreciation that would insure a sustainable correction of the US external imbalance may well be in the range of 10–20 percent, perhaps even less, in real effective terms. By these standards, the real depreciation of the dollar, especially vis-à-vis the euro, is more likely to have reached, and probably overshot, the parity that is consistent with a global correction of imbalances.

This consideration does not exclude much sharper movements over the next few quarters or even in the next few years, in the early phases of the correction (see Krugman 2007 for a particularly sharp analysis of this point). But the economic forces at play do not necessarily support scenarios of sustained extreme dollar depreciation.

We should also stress that possible substantial movements in the dollar, especially taking into account the possibility of overshooting, do not necessarily coincide with a dollar crisis. A dollar crisis could occur if there were to be an abrupt decline of the dollar as the main international reserve and vehicle currency. For instance, a premise for such a crisis could be a sudden sell-off of dollar reserves by monetary authorities around the world. While we do not attach any significant probability to such an event, we find it important to stress that a dollar crisis would be quite harmful to the process of global rebalancing. Financial turmoil would seriously undermine the foundations of world asset market integration. Even more damaging is the possibility that an abrupt depreciation of the dollar could trigger strong protectionist pressures especially in Europe.

Even without an extreme dollar depreciation, however, the correction of global imbalances can be expected to entail significant macroeconomic adjustment both in the US and in Europe. European firms are already facing much stronger and increasing competition from US firms. As there will be some reallocation of resources from the non-tradable to the tradable sector in the US, the opposite can be expected to happen in Europe.

The intensity of these effects is likely to differ across countries. While the current account for the euro

area as a whole is roughly balanced, there are substantial differences among countries. This also applies to the degree of openness and to competitiveness. One of the exercises reviewed in this chapter assumes an even distribution of adjustment across all countries. In this exercise, Germany would reduce its surplus by one half, while Italy is expected to gain competitiveness. Unfortunately, there is no guarantee that adjustment in Europe will be even. With different degrees of flexibility in economic structures, Europe runs the risk of facing a period of strong divergence in growth rates and external adjustments. Dealing with this risk is well beyond the reach of the European Central Bank, and is definitely not a reason for increasing deficit spending, which can at best provide some short-run relief. The need for correcting the global imbalances instead raises the social value of investment in reforming the goods and the labour markets at the national level, along the lines amply discussed in several earlier EEAG reports.

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